

HRS HIROSE
ELECTRIC
CO., LTD.

CO-AXIAL CONNECTORS



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World Electronics



Head Office (Tokyo)



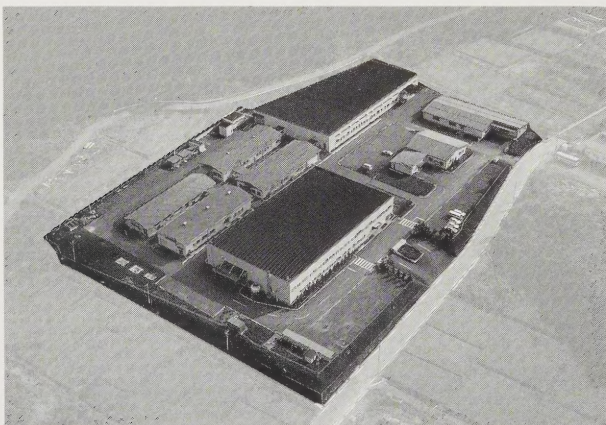
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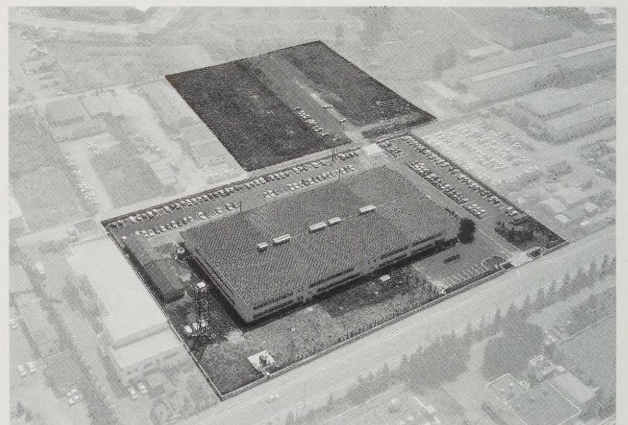
Engineering Center-Kikuna Plant (Yokohama)



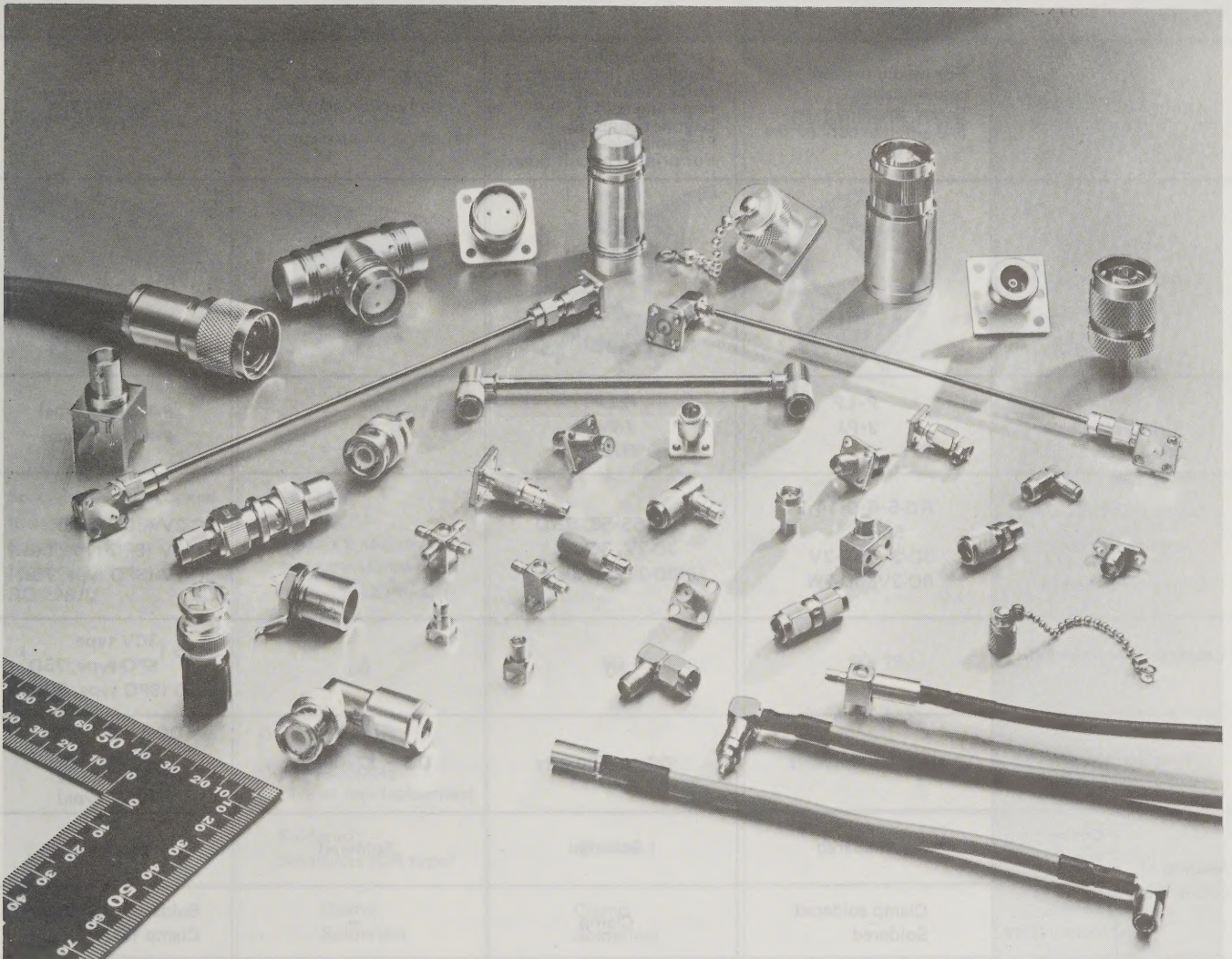
Shimomaruko Plant (Tokyo)



Tohoku Hirose Electric Co., Ltd. (Iwate)



Koriyama Hirose Electric Co., Ltd. (Fukushima)


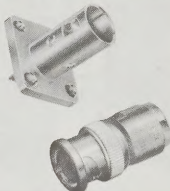
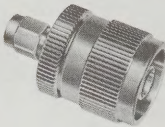
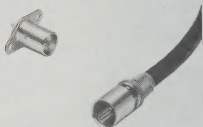


**Purely Japanese Manufactured,
International Products.**

In the Forefront of Electronic Technology

Hirose Co-Axial Connectors

List of RF co-axial products

Series		N	BNC	BWA	PO (3CV type, SPO type)
Contents					
Outline of type, etc.		For medium-sized coaxial cables Screw coupling type N-J antenna connectors	For thin cables Small-size, lightweight, quick-mounting/ removing device Bayonet coupling Plug solderless type For printed circuit boards	Conversion adapter	Push-on type
Typical photographs					
Type of shell		P•LP J•PJ R	P•LP J•PJ R•LR	A	P•R (SPO type) P•J (3CV type)
Applicable cables		RG-5•6•9•14•21 58/U 3D-2V, 5D-2V 8D-2V, 5D-2W	RG-55•58, 62/U 3C-2V, 3C-2W 3C-2T, 5D-2V		3C-2V (3CV type) 3D-2V (SPO type, 50Ω) 3C-2V (SPO type, 75Ω)
Characteristic impedance Ω		50	50	50	75 (3CV type SPO type, 75Ω) 50 (SPO type, 50Ω)
Frequency range		DC ~ 10000MHz	DC ~ 4000MHz	DC ~ 12400MHz	DC ~ 3000MHz (SPO type) DC ~ 200MHz (3CV type)
Method of connection	Center conductors	Soldered	Soldered	Soldered	Soldered
	Outer conductors	Clamp soldered Soldered	Clamp	—	Solderless (SPO type) Clamp (3CV type)
Applicable codes		Defense Agency Meet JIS standards	NTT Defense Agency Meet JIS standards	—	NTT
Plating	Center conductors	Silver	Silver	Gold-silver	Silver (SPO type) Gold (3CV type)
	Outer conductors	Silver	Silver Nickel	Gold-silver-nickel Passivated	Nickel (SPO type) Silver (3CV type)
Accessories		Adapter Cap	Adapter Cap	—	—
Remarks					Solderless bonding tool SPO-P-T (SPO type)
Catalog pages		7 ~ 14	15 ~ 22	25 ~ 29	30 ~ 31

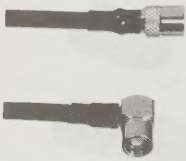
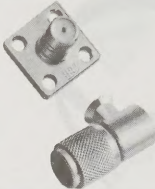

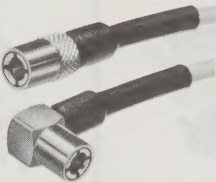
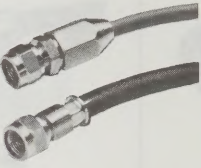
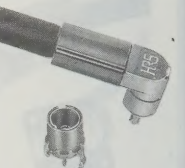
(Note) Meaning of shell types and alphabetical symbols in the "Remarks" column:

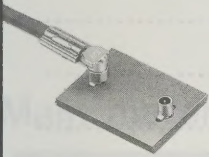
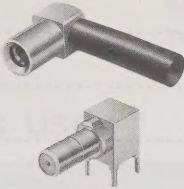
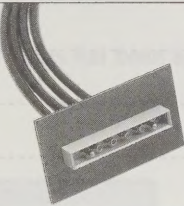
P: plug, LP: L-bent plug, J: jack, PJ: panel jack, R: receptacle, LR: L-bent receptacle, PR: plug receptacle A: adapter, R-PC: receptacle for printed circuit board

MRF (TWT2 type)	UM	MSS	CA	HRM
Coaxial two-core Screw coupling type	For ultrathin coaxial cables Push-on type (Q) Screw coupling type (S)	Ultrasmall-type for high frequencies Push-on type	For cable assembly Screw coupling type	SMA type Screw coupling type
				
P R	P•LP J•PJ R•R-PC	P•LP J•PJ R•R-PC	—	P•LP J•PJ R•PR•LR
Special two-core coaxial (manufactured by Sumitomo Electric Industries, Ltd.) RG-22B/U	1.5D-2V RG-196/U 1.5D-XV (Solderless) 2.5D-2V (Solderless) 2.5C-2V (Solderless)	1.5D-2V 2.5D-2V RG-55, 174, 196/U	3C-2V RG-58/U	3D-2W (Irrax cable) RG-142B/U .141-inch semi-rigid .085-inch semi-rigid
95	50	50	50.75	50
DC ~ 200MHz	DC ~ 1000MHz 1.2 or less DC ~ 1500MHz 1.2 or less (solderless)	DC ~ 2000MHz	DC ~ 3000MHz	DC ~ 12.4GHz (18GHz also available)
Soldered	Soldered Solderless (CR type)	Soldered	—	Soldered
Clamp	Clamp Solderless	Clamp Solderless	—	Solderless Soldered
Meet MIL specifications	Defense Agency JIS	Defense Agency	NTT	Meets standards of SMA type (MIL)
Silver	Gold-silver	Gold	—	Gold
Nickel	Gold-nickel	Gold	—	Gold-nickel Passivated
Adapter	Adapter Dummy load	Adapter	—	Adapter Cap Dummy load
Interchangeable with products meeting MIL specifications	Solderless tools UM-MSS-T-1 UM-CR-T-1 (CR type) UM-CR-T-3 (CR type)	Solderless tools UM-MSS-T-1		Connecting tools HRM-T-1 2, 3, 4, 5, 6, 7, 8, 9
32 ~ 35	34 ~ 44	45 ~ 48	49 ~ 50	.51 ~ .86

(Continued on next page) ➡

List of RF co-axial products

MP	POB	POD	PO6	NF	FL
Push-on type	Push-on type	Ultrasmall type, push-on type	Ultrasmall type, low profile	For satellite broad- casting C15 type	Low-profile microminiature type
					
P•LP PJ R•PR	P•LP J•PJ R•PR•LR	1.5D-2 P•LP•J•LJ R•A	P•LP•R•LR R•PC	P•R	LP R•PC
2.5C-XW (Irrax cable) 2.5C-2W	3D-2W (Irrax cable) RG-142B/U RG-55, 58/U .141-inch semi-rigid .085-inch semi-rigid	1.5D-2V 1.5D-2W 2.5D-2V .085-inch semi-rigid	RG-196/U	TVEFCX 5C-FB	1.5D-QEW 1.5C-QEW•CW
75	50	50	50	75	50
DC ~ 140MHz	DC ~ 12.4GHz	DC ~ 8GHz	0 ~ 2000MHz	DC ~ 1500MHz	DC ~ 1500MHz
Soldered	Soldered	Soldered	Soldered	Solderless	Solderless
Solderless	Solderless	Solderless	Solderless	P — Solderless WP — Screw in	Solderless
				EIAJ	
Gold	Gold	Gold	Gold	Silver	Gold
Nickel	Gold	Nickel	Nickel	Nickel	Silver
Adapter Dummy load	Adapter Dummy load	Adapter			FL-harness inspection receptacle FL-LP-N
Solderless tools MP-T-2	Connecting tools POB-T-1 HRM-T-4,5,6,8,9	Connecting tools POD-T-1 HRM-T-9 POD-T-2	Connecting tools PO6-T-1		Connecting tools Hi-Flex Connecting Press FL-LP-C(1.5D) FL-LP-C(1.5C)
87 ~ 91	92 ~ 112	113 ~ 128	129 ~ 133	134 ~ 141	143 ~ 153

S.FL	PL71	PO73
Low-profile microminiature type	75Ω Sub-Miniature Push-on Lock type	Composite Connector for Digital System Communication Network packaging
		
LP R·PC	P·LP R·PC LR·PC R	P·A·J
0.8D—QEW—CW	OD	3C—2T 3C—2W 2.5D-2V
50	75	75
DC ~ 2500MHz	10MHz ~ 1GHz	DC ~ 70MHz
Solderless	Soldered	Soldered
Solderless	Solderless	Solderless
Gold	Gold	Gold
Silver	Nickel	Nickel
		Plug Monitor U Link Plug Termination Housing
155 ~ 156	157 ~ 160	161 ~ 164

MEMO :

Overview

The N series of connectors are medium-sized, weather-resistant constant-impedance coaxial connectors of the screw-coupling type, suited for use with medium-sized coaxial cables. Their rated voltage is 500V (rms). The nominal impedance is 50Ω, and they can be used with frequencies of up to 10000MHz. At low frequencies, they can be used with 75Ω cables. They are suited primarily for coaxial cables RG-5, 6, 8, 9/U, etc.

The N series has been approved in Defense Agency specification DSP C 6201.

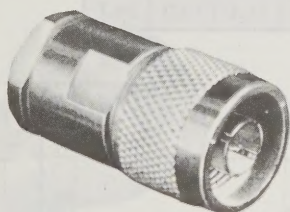
Main materials used

Parts	Materials	Finish
Armor (shell)	Brass	Silver plating + surface treatment
Outer contacts	Phosphor bronze	Silver plating + surface treatment
Male ends	Brass	Silver plating + surface treatment
Female ends	Beryllium copper	Silver plating + surface treatment
Insulation	Tetrafluoride resin	
Packing	Silicone rubber	

Main performance characteristics

Items	Standard value
Contact resistance	3mΩ or less (at 1A DC)
Insulation resistance	1000MΩ or more at 500V DC
Withstand voltage	1500V AC (rms) for 1 minute
Characteristic impedance	50Ω

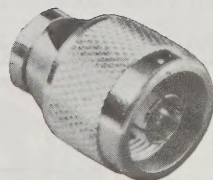
N-P plugs



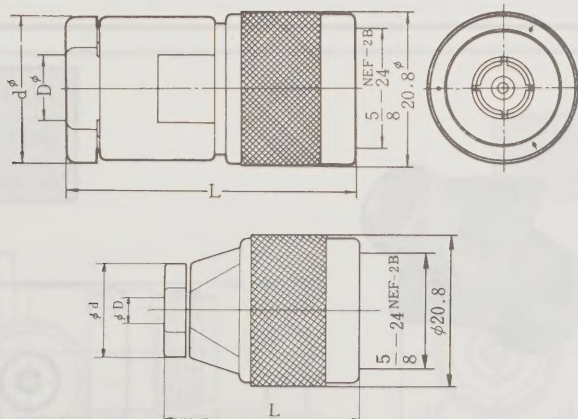
UG-21D/U

Part No.	Applicable cables	Dφ	dφ	L	Remarks
UG-18C/U	RG-5.6.21/U	8.7	19.0	38	
*UG-21D/U	RG-8.9/U	11.1	19.0	38	
UG-204C/U	RG-14/U	14.1	22.2	45	
*UJG-536/U	RG-58/U	5.4	19.0	38	For low-voltage use Withstand voltage 500V
N-P-3DV	3D-2V	6.3	12.7	35	
*N-P-5DV	5D-2V	8.6	18.0	45.5	
N-P-8DV	8D-2V	12.6	23.0	51	

*Standard product



N-P-141

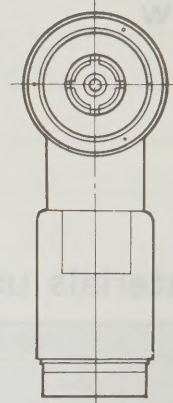
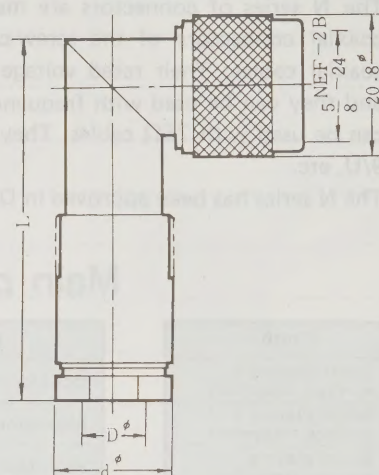


Part No.	Applicable cable	φD	φd	L
N-P-141	UT-141A	3.63	13	27.3

*Standard product

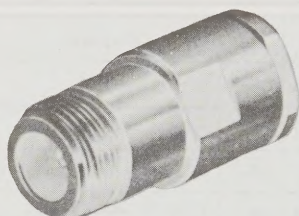


N-LP-5DW



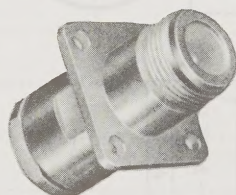
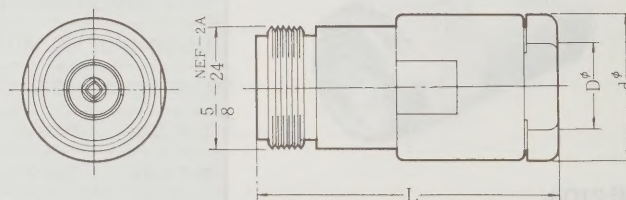
Part No.	Applicable cables	Dφ	dφ	L	Remarks
N-LP-5DW	5D-2W	9.3	17.5	52.4	Nickel-plated except for center conductor
*N-LP-58U	RG-58/U	5.3	15.5	44.0	

*Standard products



UG-23D/U

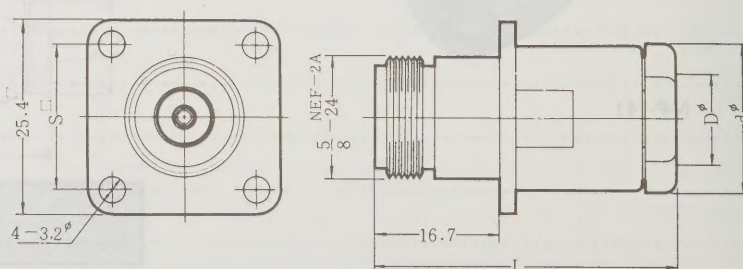
Part No.	Applicable cable	Dφ	dφ	L
UG-23D/U	RG-8,9/U	11.1	19.0	39.7



UG-22D/U

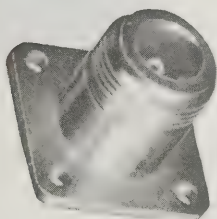
Part No.	Applicable cables	Dφ	dφ	L	S□
UG-22D/U	RG-8,9/U	11.1	19.0	39.7	18.24
*N-PJ-58/U	RG-58/U	5.4	14.6	41.5	18.2

*Standard product

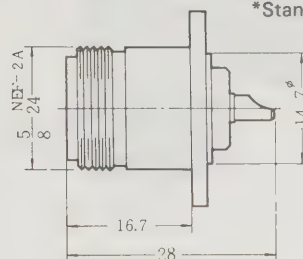
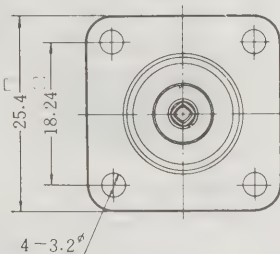


N SERIES

RF CO-AXIAL CONNECTORS



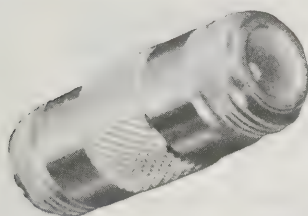
UG-58A/U



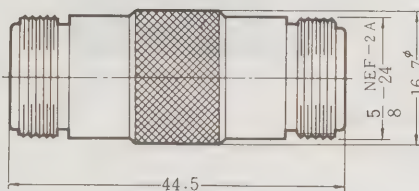
Part No.

*UG-58A/U

*Standard product



UG-29B/U



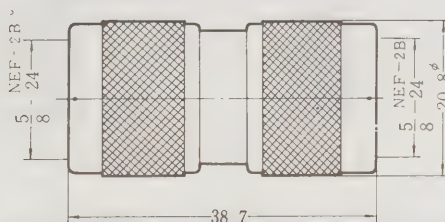
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Part No.

UG-29B/U



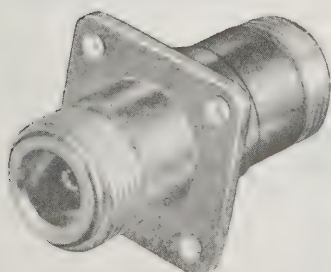
UG-57B/U



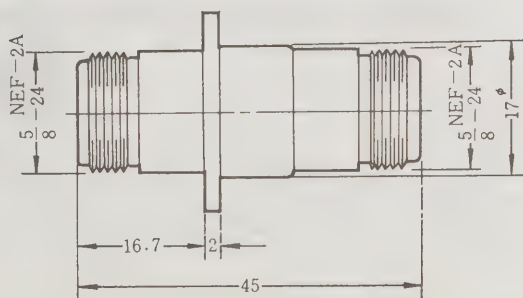
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Part No.

UG-57B/U

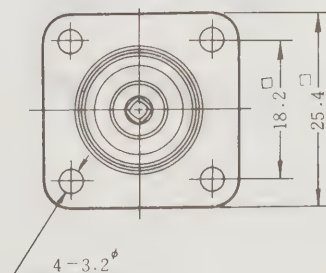


N-PA



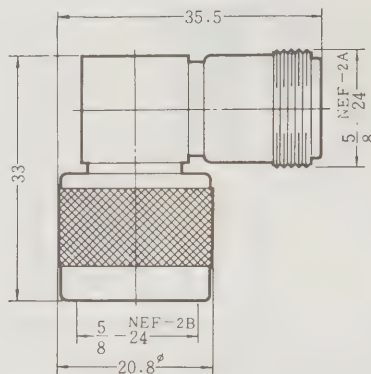
Part No.

N-PA



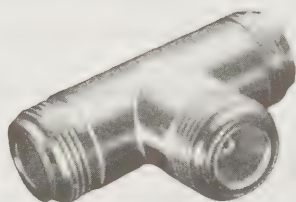


UG-27C/U



Part No.

UG-27C/U

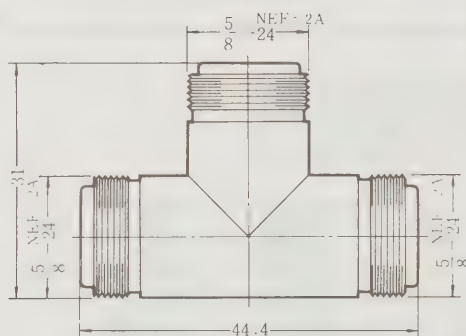


UG-28A/U

JJJ

Part No.

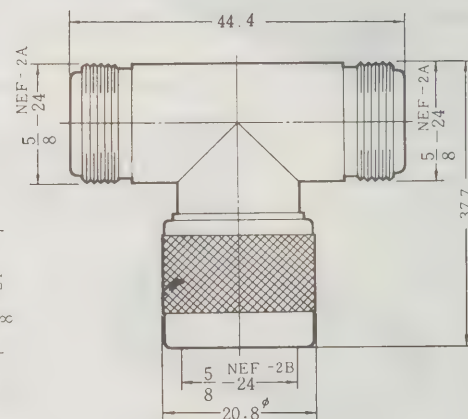
UG-28A/U



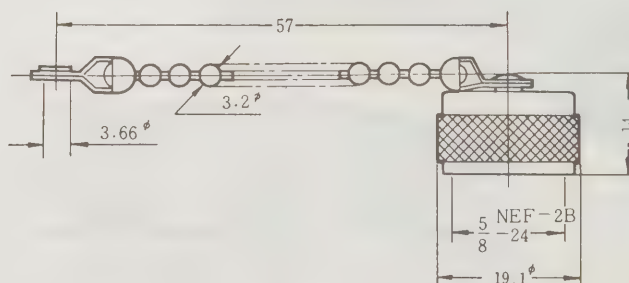
JPJ

Part No.

UG-107B/U



MX-913/U

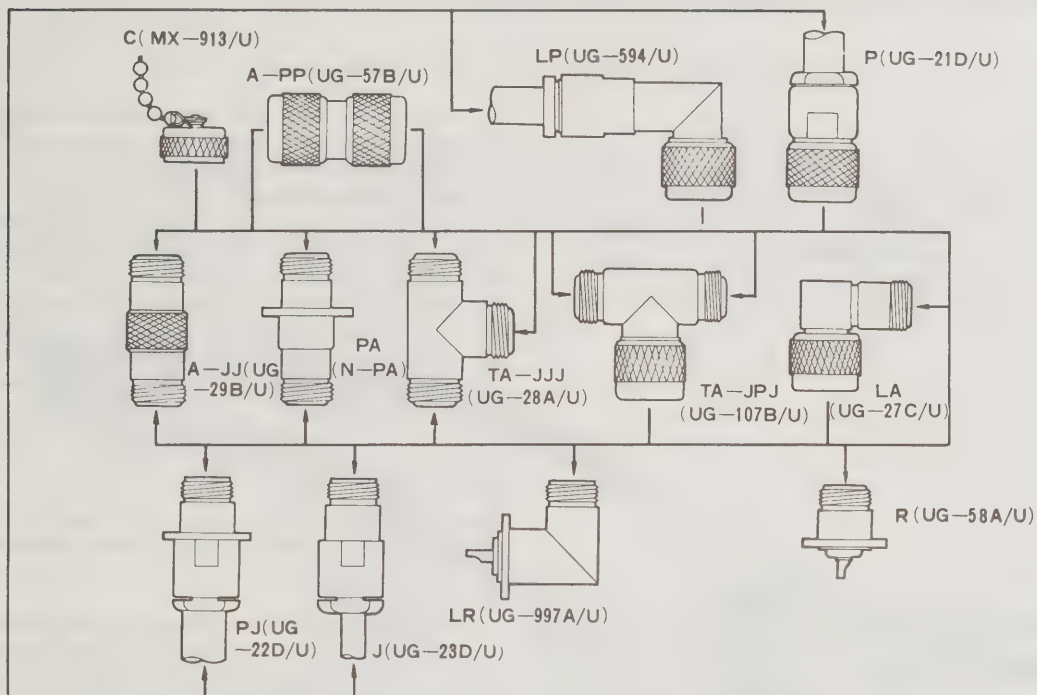


Part No.

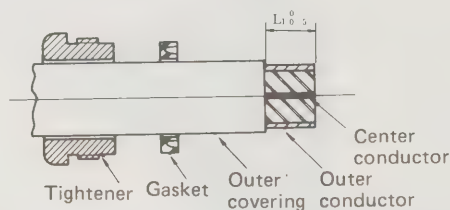
MX-913/U

Functional drawing

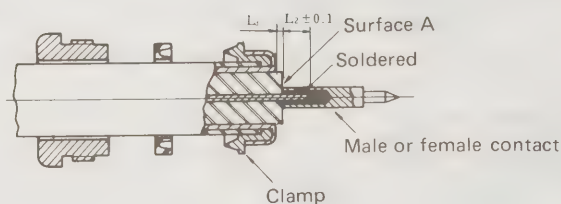
Typical product numbers are enclosed in parentheses.



Connecting methods



The cable ends are processed as shown in the drawing (refer to Table 1). For the end processing dimensions L_1 , refer to Table 1, End processing dimensions arranged by part number.



- (1) Insert clamp from tip of cable and fold outer conductor of cable back onto clamp. Using a knife, cut off excess outer conductor left at this time.
- (2) Cut off center conductor of cable at L_2 , from surface A of cable insulation. For end processing dimensions L_2 , L_3 , refer to Table 1, End processing dimensions arranged by part number. (L_3 is a reference dimension.) (Note: Be careful not to damage center conductor.)
- (3) Solder contact and center conductor. It is a good idea at this time to solder the contact preliminarily in advance. (Note: There must be no gap between the contact and the cable insulation.)



Insert cable and parts into shell and fit sharp end of clamp completely into V-shaped surface of gasket. Tighten tightening nut sufficiently.

■ Remarks

1. The cable end processing dimensions are those of general connectors based on the MIL and DSP standards. They may differ somewhat depending on the type of cable. In such cases, match the dimensions with the connectors.
2. Some clamps and gaskets are not V-shaped, but the connecting procedures are the same.

Table 1. End processing dimensions arranged by part number

(Unit: mm)

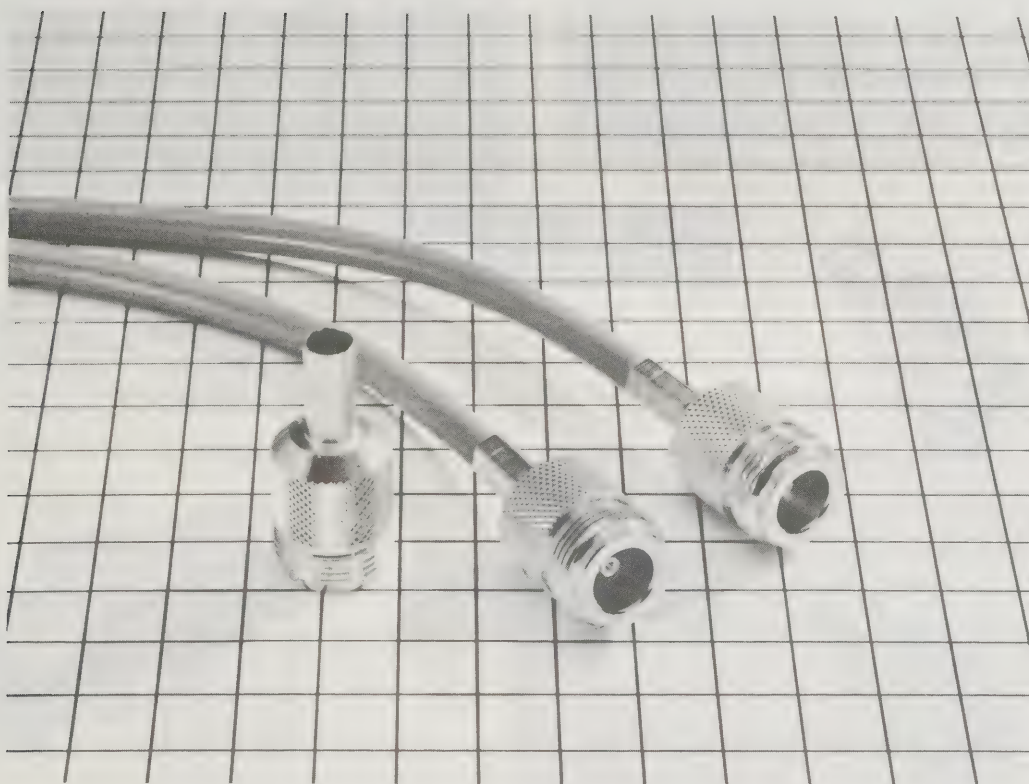
Part No.	$L_1 \begin{smallmatrix} 0 \\ -0.5 \end{smallmatrix}$	$L_2 \pm 0.1$	L_3
* JUG-536/U	8.6	6	1
UG-18C/U	9.6	6	1
* UG-21D/U	10.0	6	1
N-LP-5DW	11.5	4	3.5
UG-23D/U	8.5	5	1
UG-22D/U	8.5	5	1
* N-PJ-58/U	7.4	3	3.2
UG-204C/U	11.5	6	2
N-LP-58U	9.2	4	3.6
N-P-3DV	12.3	6	4.8
N-P-8DV	12.3	5.5	3
* N-P-5DV	11.1	6	1.5

*Standard product

N-J Antenna Connectors D.C. ~ 1500MHZ

Overview

N-J antenna connectors are connectors that were VE-developed as antenna connectors for mobile equipment such as CB radios, MCA or automobile telephones (cellular).



Characteristic features

- (1) The high-frequency performance is excellent: the VSWR is 1.2 or less at frequencies of 0 ~ 1500MHz.
- (2) Inexpensive and sturdy.
- (3) Suitable for two types of cables: 3D-XW (double shield) and 3D-2V (single shield).
- (4) Harnessed types are also produced.

Applications

CB radios, MCA, Cellular telephones, etc.

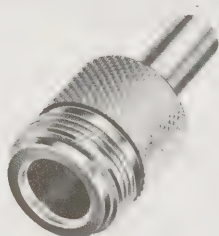
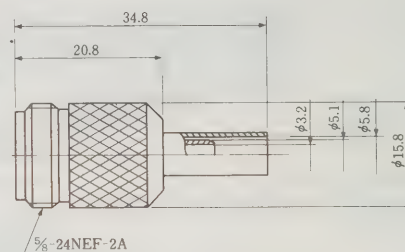
Performance characteristics

Items	Standard value
Impedance	50Ω
Insulation resistance	1000MΩ or higher at 500V DC
Contact resistance	3mΩ or less in both center and outer conductors at 1A DC
Withstand voltage	500V AC
Voltage standing wave ratio	1.2 or less at 0 ~ 1500MHz

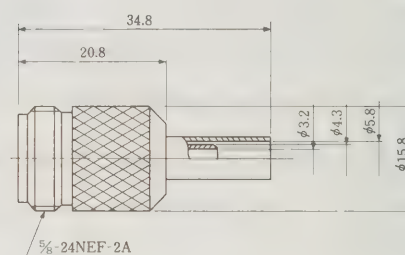
Guide to products Connectors



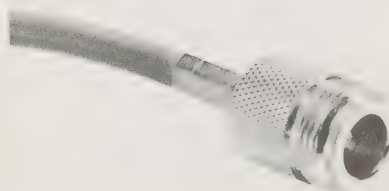
Part No.	Applicable cable
N-J-3DW	3D-XW



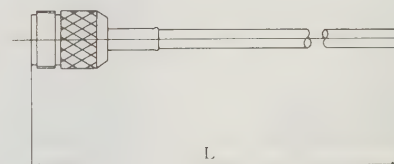
Part No.	Applicable cable
N-J-3DV	3D-2V



Harnessed type



Part No.	Applicable cables
N-J-3DW-()	3D-XW
N-J-3DV-()	3D-2V



(Overall length L is specified in mm)

BNC SERIES RF CO-AXIAL CONNECTORS

Overview

The BNC series are small-sized, lightweight, quick mounting/removing type weather-resistant connectors with bayonet lock couplings which are suited for use with thin coaxial cables. Their rated voltage is 500V (rms). A nominal impedance of 50Ω is standard, but connectors for 75Ω cables (RG-59/U, 3C-2V, etc.) are also available. They are suited chiefly for coaxial cables RG-55-58/U, etc. The BNC series has been approved in Defence Agency specification DSP C 6202.

Main materials used

Parts	Materials	Finish
Armor (shell)	Brass	Silver plating + surface treatment
Outer contact	Brass	Silver plating + surface treatment
Male contact	Brass	Silver plating + surface treatment
Female contact	Beryllium copper	Silver plating + surface treatment
Insulation	Tetrafluoride resin	
Packing	Silicone rubber	

Main performance characteristics

Items	Standard value
Contact resistance	$3\text{m}\Omega$ or less (at 1A DC)
Insulation resistance	$5000\text{M}\Omega$ or more at 500V DC
Withstand voltage	1500V AC (rms) for 1 minute
Characteristic impedance	50Ω

BNC-P plug

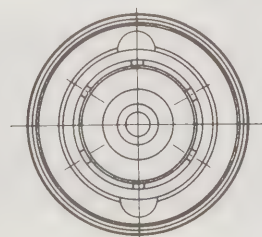
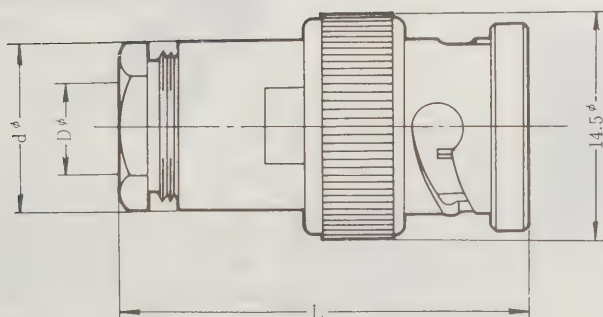


UG-88/U

Part No.	Applicable cables	D ϕ	d ϕ	L
*UG-88/U	RG-55, 58/U	5.4	11.1	26.5
*3CA-P2	RG-58/U	5.6	13.7	29.5
*UG-88D/U	RG-55, 58/U	5.6	12.7	28.8
*UG-260/U	RG-59, 62/U	6.6	11.1	26.5
*3CV-P2	3C-2V	6.3	13.7	29.5
*3CW-P	3C-2W	7.1	14.2	29.7
*3DW-P2	*3D-2W (Irrax)	6.0	13.7	29.5
*3CF-P	*Type F coaxial cable	4.2	13.7	29.5
3CT-P	3C-2T	8.0	14.2	29.7
*BNC-P-5DV	5D-2V	7.8	15.0	31.0

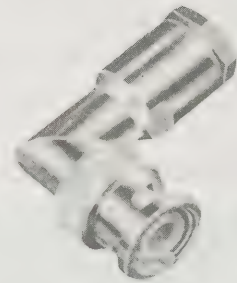
*Standard product

*Manufactured by Sumitomo Electric Industries, Ltd.

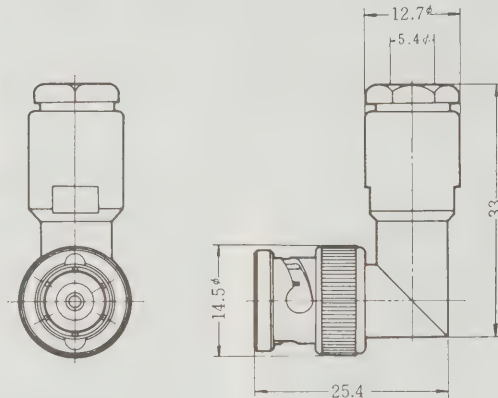


BNC SERIES RF CO-AXIAL CONNECTORS

BNC-LP L-type plugs

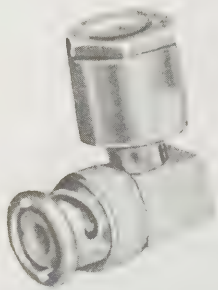


UG-913/U

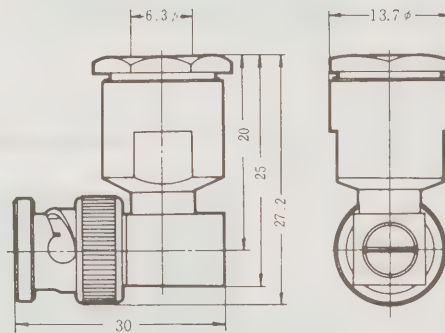


Part No.	Applicable cable
*UG-913/U (02)	RG-55, 58/U

*Standard product



3CV-PL



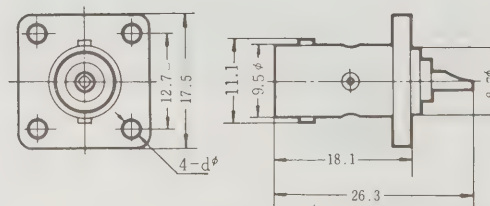
Part No.	Applicable cable
*3CV-PL	3C-2V

*Standard product

BNC-R receptacles



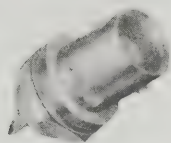
UG-290/U



Part No.	dφ
*UG-290/U	M2.6 x 0.45
*3C-R	3

*Standard product

BNC SERIES RF CO-AXIAL CONNECTORS

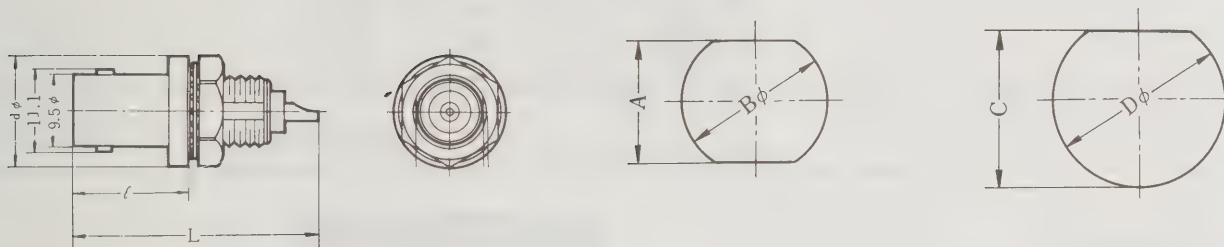


UG-625/U

Part No.	dφ	ℓ	L	A	Bφ	C	Dφ	Remarks
*UG-604/U	14.3	13.7	26.3	8.1 ^{+0.1} ₋₀	9.6 ^{+0.1} ₋₀			
*UG-625/U	12.7	12.7	26.3			10.3 ^{+0.1} ₋₀	11.3 ^{+0.1} ₋₀	
*UG-657/U	14.5	15.2	32.6	8.6 ^{+0.1} ₋₀	9.6 ^{+0.1} ₋₀			Drip-proof type
UG-1094/U	12.7	11.9	27.0			8.8 ^{+0.1} ₋₀	9.6 ^{+0.1} ₋₀	

*Standard product

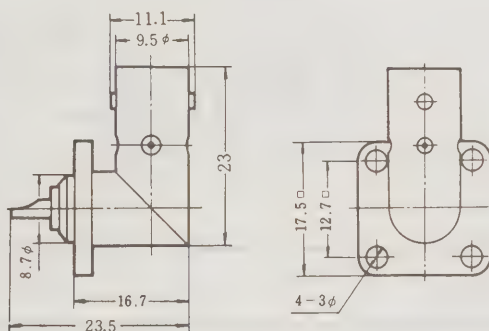
Fig. 1



BNC-LR L-type receptacle



BNC-LR

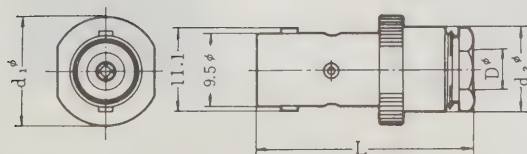


Part No.
*BNC-LR

*Standard product

BNC-J jack

UG-89/U

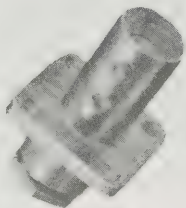


Part No.	Applicable cables	Dφ	d ₁ φ	d ₂ φ	L
UG-89/U	RG-55, 58/U	5.4	15.0	11.1	28.7
UG-261/U	RG-59, 62/U	6.6	15.0	11.1	30.0
3CV-J	3C-2V, 3D-2V	6.3	14.0	11.1	28.7

BNC SERIES RF CO-AXIAL CONNECTORS

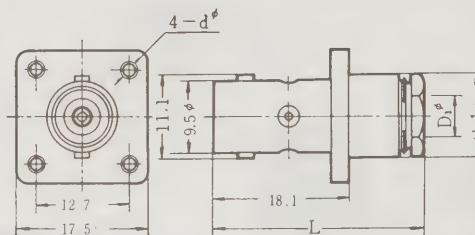
BNC-PJ panel jacks

UG-291/U



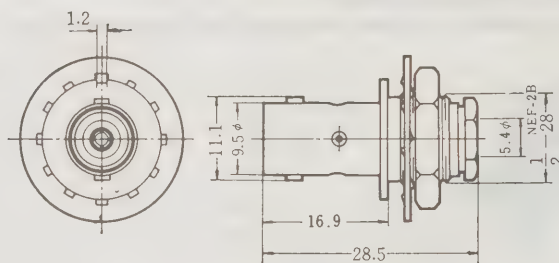
Part No.	Applicable cables	$D_1 \phi$	L	$d \phi$
*UG-291/U	RG-55, 58/U	5.4	28.2	M2.6x0.45
*3CA-PJ2	RG-58/U	5.4	28.7	3
UG-262/U	RG-59, 62/U	6.6	28.4	M2.6x0.45
*3CV-PJ2	3C-2V, 3D-2V	6.3	28.7	3

*Standard product



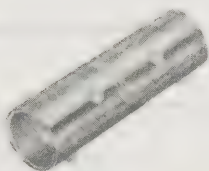
Part No.	Applicable cable
*BNC-PJ-58	RG-55, 58/U

*Standard product

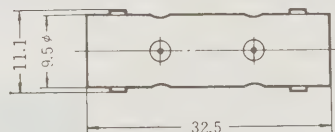


BNC-A linear adapters

BNC-A-JJ



JJ



Part No.

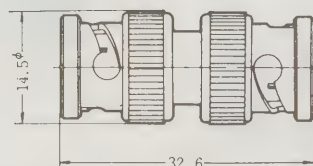
*BNC-A-JJ

*Standard product

UG-491/U



PP

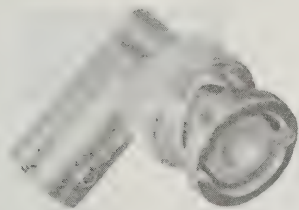


Part No.

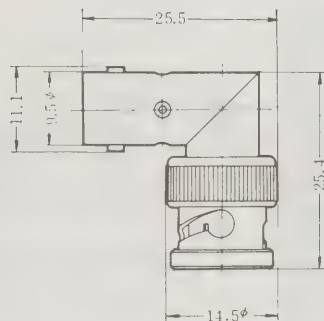
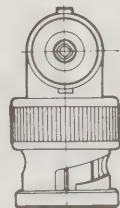
UG-491/U

BNC SERIES RF CO-AXIAL CONNECTORS

BNC-LA L-type adapter



UG-306/U

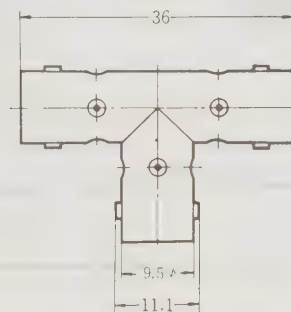


Part No.
*UG-306/U

BNC-TA T-type adapter

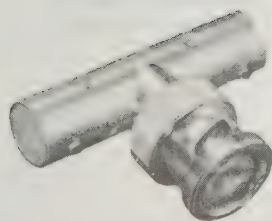


BNC-TA-JJJ

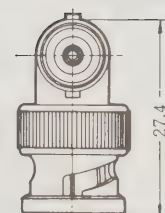
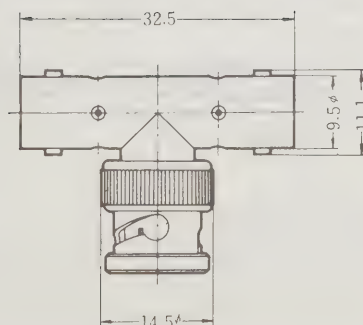


Part No.
*BNC-TA-JJJ

JJJ



UG-274/U



Part No.
*UG-274/U

JPJ

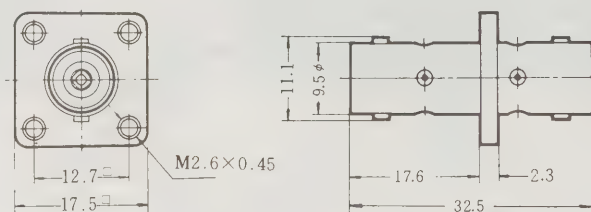
*Standard product

BNC SERIES RF CO-AXIAL CONNECTORS

BNC-PA panel adapter



UG-414/U

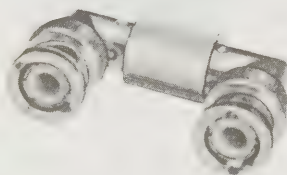


Part No.

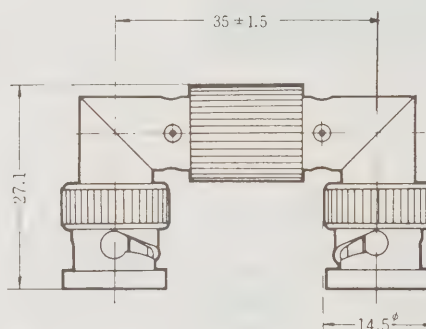
*UG-414/U

*Standard product

BNC-UPA U-link



BNC-UPA



Part No.

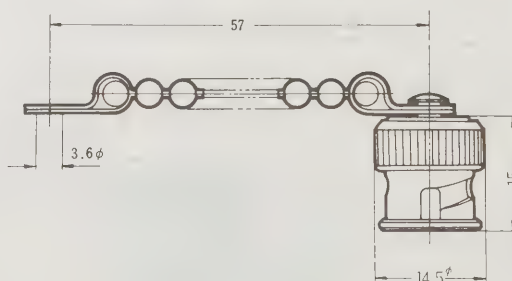
*BNC-UPA

*Standard product

BNC-C cap



CW-123A/U



Part No.

*CW-123A/U

*Standard product

BNC SERIES RF CO-AXIAL CONNECTORS

Functional drawing

Typical part numbers are enclosed in parentheses

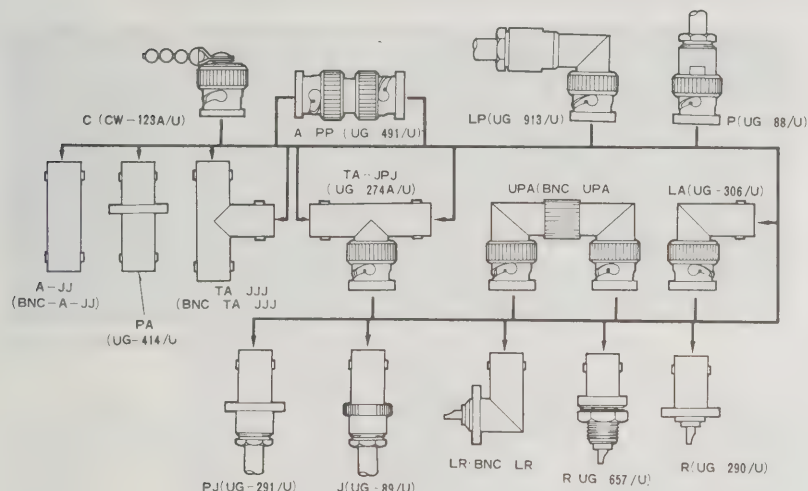
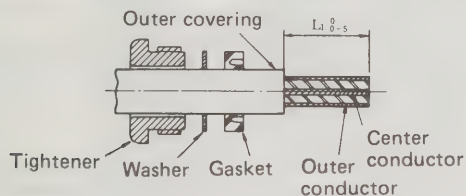


Table 1. End processing dimensions arranged by part number

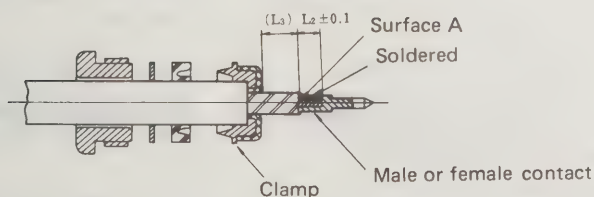
(Unit: mm)

Part No.	$L_1 \begin{smallmatrix} 0 \\ -0.5 \end{smallmatrix}$	$L_2 \pm 0.1$	L_3
*UG-88/U	7.5	3	2.9
*UG-260/U	7.6	3	2.9
3CV-J	7.4	3	3.2
UG-262/U	7.3	3	2.9
UG-89/U	7.5	3	2.9
UG-261/U	7.3	3	2.9
*UG-291/U	7.5	3	2.9
*UG-913/U	7.4	3	2.4
*UG-88D/U	7.6	3	2.7
*3DW-P2	10	3	5
*BNC-P-5DV	11.4	2.5	5
*3CF-P	10	3	5
*3CV-PL	9.4	5.3	1.8
*3CV-P2	9.6	3	5
*3CA-P2	9.6	3	5
*3CV-PJ2	7	3	2.8
*3CA-PJ2	7	3	2.8
*3CW-P	10.4	3	5
3CT-P	10.9	3	5

*Standard product



The ends are processed as shown in the drawing (refer to Table 1). For the end processing dimensions L_1 , refer to Table 1, End processing dimensions arranged by part number.



- (1) Insert clamp from tip of cable and fold outer conductor of cable back onto clamp. Using a knife, cut off excess outer conductor left at this time.
- (2) Cut off center conductor of cable at L_2 , from surface A of cable insulation. For end processing dimensions L_2 , L_3 , refer to Table 1, End processing dimensions arranged by part (L_3 is a reference dimension.)
(Note: Be careful not to damage center conductor.)
- (3) Solder contact and center conductor. It is a good idea at this time to solder the terminal preliminarily in advance.
(Note: There must be no gap between the end and the cable insulation.)



Insert cable and parts into shell and tighten tightening nut sufficiently.

BNC SERIES RF CO-AXIAL CONNECTORS

BNC-P plugs of split assembly type

Characteristic features

Few parts need handling when connecting the wiring.

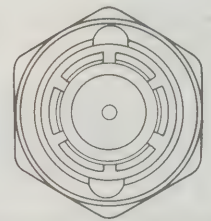
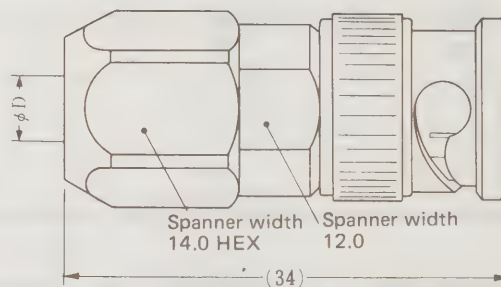
Precision processing of cable ends is not required.

Cables are not damaged.

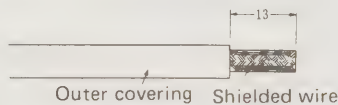
Center contacts have a mechanism to prevent backing up.

Specification code	Specification name	Part No.	Applicable cables	ϕD
		BNC-P-5DW-SA	5D-2W, 5C-2W	8.7
01	Nickel-plated except for male contact	BNC-P-5DW-SA	5D-2W, 5C-2W	8.7
		*BNC-P-5DV-SA	5D-2V, 5C-2V	8.0
01	Nickel-plated except for male contact	BNC-P-5DV-SA	5D-2V, 5C-2V	8.0
		*BNC-P-3DV-SA	3D-2V, 3C-2V	6.3
01	Nickel-plated except for male contact	BNC-P-3DV-SA	3D-2V, 3C-2V	6.3

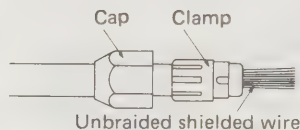
*Standard product



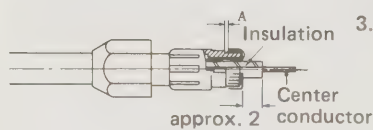
Assembling methods



1. Cut off 13mm of the cable's outer covering and expose the shielded wire.



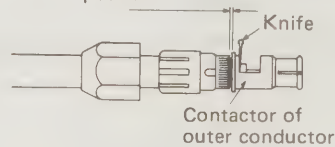
2. Put the cap through the cable, insert the clamp, and unbraid the shielded wire.



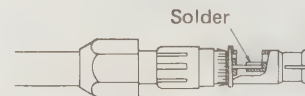
3. Wind the shielded wire onto the clamp. At this time, cut off the shielded wire at position A in the drawing, leaving some gap.

4. Cut off the insulation, leaving about 2mm of it.

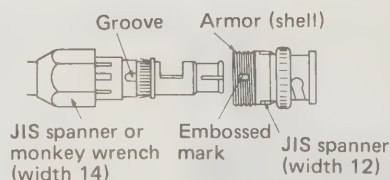
Fit tightly, trying to leave as little gap as possible.



5. Fit the contactor of the outer conductor tightly onto the clamp, position a knife on the notched window, and cut off the insulation. Take care not to damage the center conductor at this time.



6. Solder the center conductor with the contactor of the outer conductor fitting tightly onto the clamp.



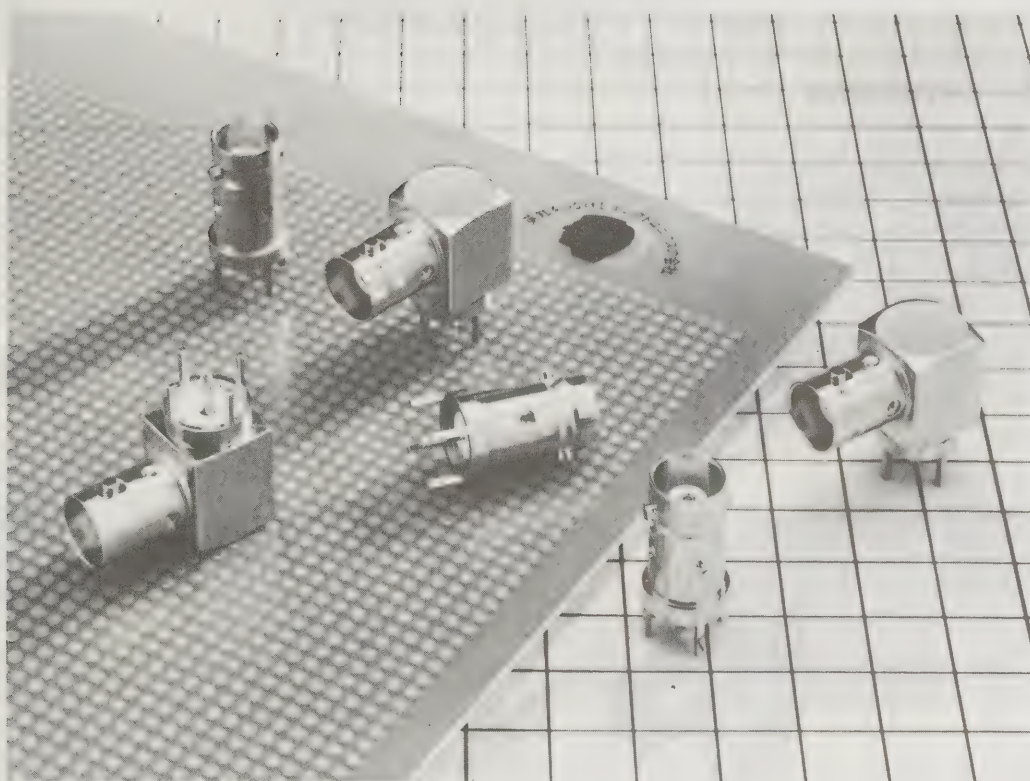
7. Insert the block described above so that it will fit into the groove on the clamp and the embossed mark on the armor. Tighten the cap thoroughly. The tools used are a JIS spanner (width 12) and a JIS spanner or monkey wrench (width 14).

BNCSERIES *RF* CO-AXIAL CONNECTORS

BNC connectors for printed circuit boards

Overview

BNC connectors for printed circuit boards have been developed so that they can be mounted directly onto printed circuit boards without any accessories.



Characteristic features

- (1) There are large cost benefits because the wiring between the printed circuit board and the panel can be omitted.
- (2) Dip soldering is possible because the Teflon insulation is highly resistant to heat.
- (3) The long dip post (5mm) enables the connectors to be used even in thick printed circuit boards.

Applications

Measuring equipment, broadcasting equipment, etc.

BNC SERIES RF CO-AXIAL CONNECTORS

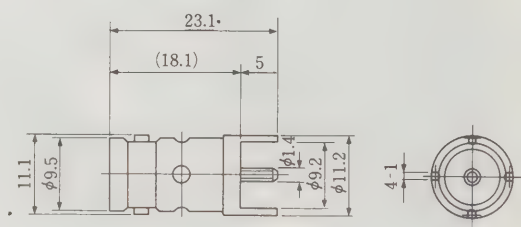
Performance characteristics

Items	Standard value
Impedance	50Ω
Insulation resistance	1000MΩ or higher at 500V DC
Contact resistance	3mΩ or less in both center and outer conductors at 1A DC
Withstand voltage	1500V AC

Guide to products

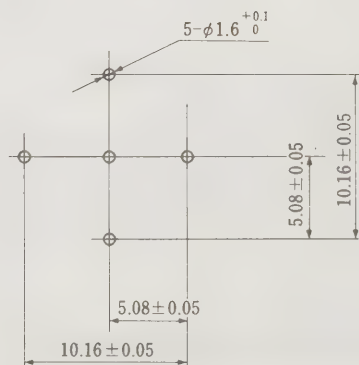
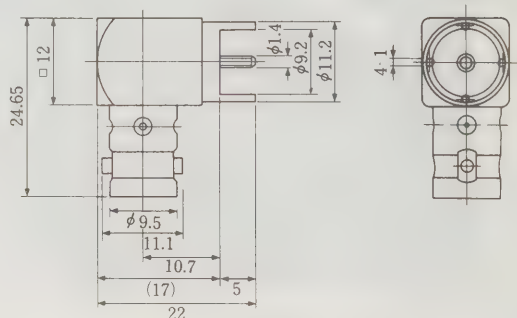
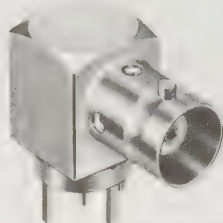
Part No.

BNC-R-PC



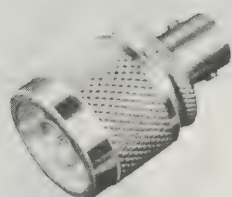
Part No.

BNC-LR-PC



The adapters shown here (BWA series) are used when linking connectors of different types. Their openings correspond to the standards for those connectors.

Conversion adapters



JUG-201A/U

Fig. 1

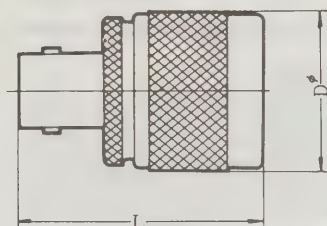
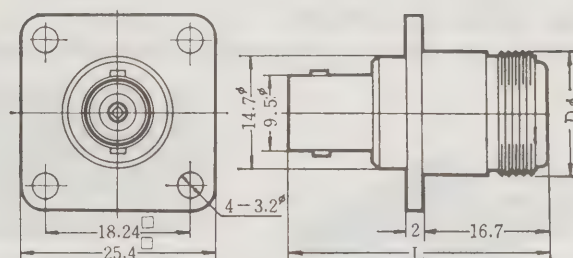
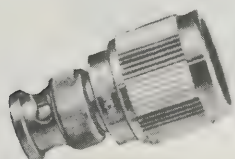


Fig. 2

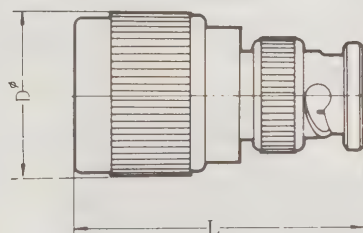


Part No.	Type, opening	L	Dφ	Remarks
NP-BNCP	NP-BNCP	38	21	
*JUG-201A/U	NP-BNCJ	32.3	21	Fig. 1
UG-349/U	NJ-BNCP	38.5	15.9	
NJ-BNCJ	NJ-BNCJ	34.4	17	
NJ-BNCJ-PA	NJ-BNCJ-PA	34.4	15.9	Fig. 2

*Standard product



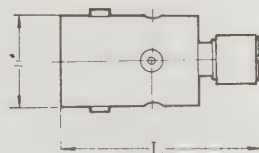
SP-BNCP



Part No.	Type, opening	L	Dφ
SP-BNCP	SP-BNCP	38	21
SJ-BNCP	SJ-BNCP	38.5	15.9
SP-BNCJ	SP-BNCJ	32.4	21
SJ-BNCJ	SJ-BNCJ	34.4	17



BNCJ-UMP

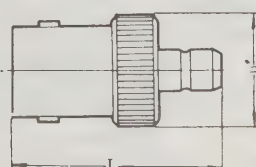


Part No.	Type, opening	L	Dφ
*BNCP-UMJ	BNCP-UMJ	22.5	14.5
*BNCJ-UMP	BNCJ-UMP	21.9	9.5
*BNCJ-UMJ	BNCJ-UMJ	22.5	14.5

*Standard product



BNCJ-MSSJ



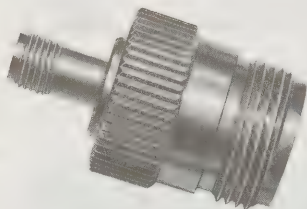
Part No.	Type, opening	L	Dφ
BNCP-MSSJ	BNCP-MSSJ	27	14.5
BNCJ-MSSP	BNCJ-MSSP	25	11
BNCJ-MSSJ	BNCJ-MSSJ	23.1	11
BNCP-MSSP	BNCP-MSSP	26.7	14.5

Conversion adapters HRM-500~599

The conversion adapters for connecting between the HRM series and other series are in three groups: those for the S series, those for the BNC series, and those for the N series.

Those for the S series and BNC series are available in two types. In both, the S-series or BNC-series parts are made of brass. In one type, the HRM-series parts are split into two segments made of stainless steel. In the other type, they are of an integral type fabricated from one piece of stainless steel.

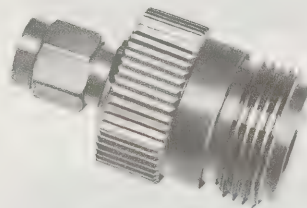
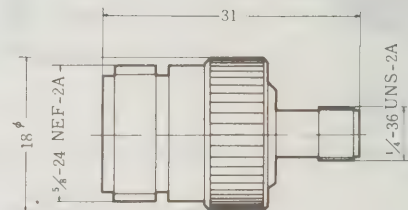
For the S series



Part No.
* HRM-506
* HRM-506S
** HRM-506-1S

S series female —
HRM series female

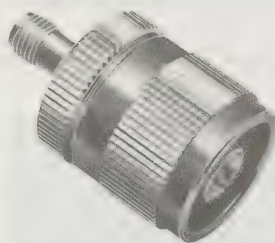
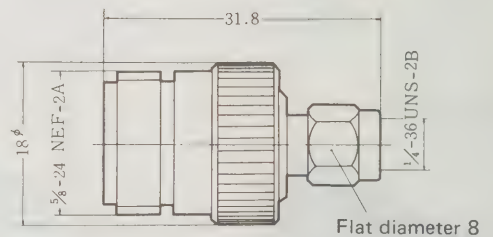
* Split into two segments
** Integral



Part No.
* HRM-507
* HRM-507S
** HRM-507-1S

S series female —
HRM series male

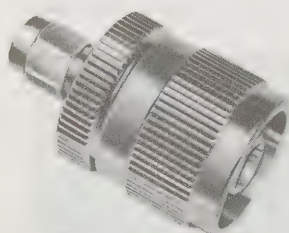
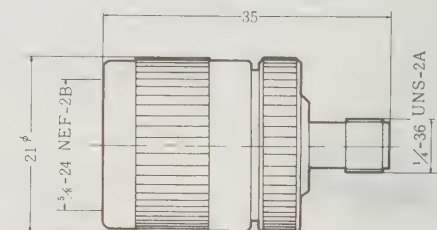
* Split into two segments
** Integral



Part No.
* HRM-508
* HRM-508S
** HRM-508-1S

S series male —
HRM series female

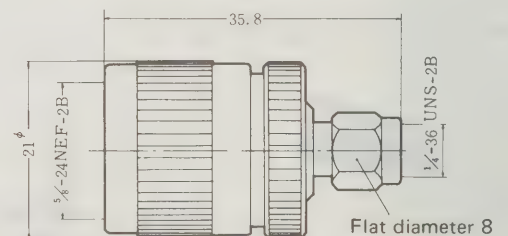
* Split into two segments
** Integral



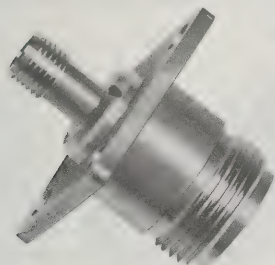
Part No.
* HRM-509
* HRM-509S
** HRM-509-1S

S series male —
HRM series male

* Split into two segments
** Integral

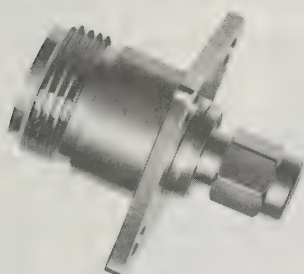
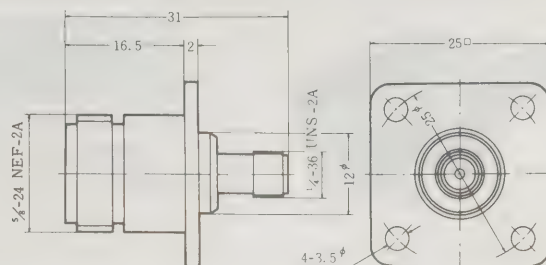


BWA SERIES RF CO-AXIAL CONNECTORS



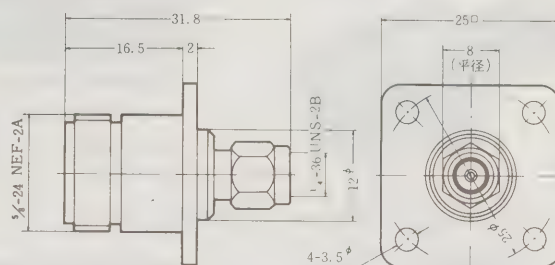
Part No.
* HRM-511
* HRM-511S
**HRM-511-1S

S series female —
HRM series female
Panel adapter
* Split into two segments
** Integral

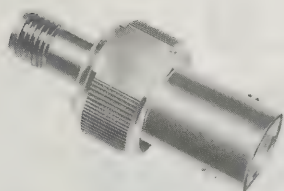


Part No.
* HRM-512
* HRM-512S
**HRM-512-1S

S series female —
HRM series male
Panel adapter
* Split into two segments
** Integral

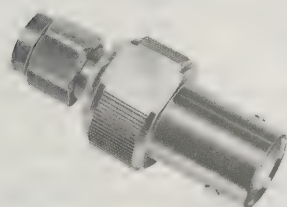
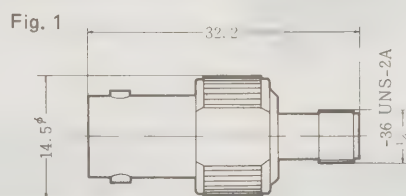


For BNC Series



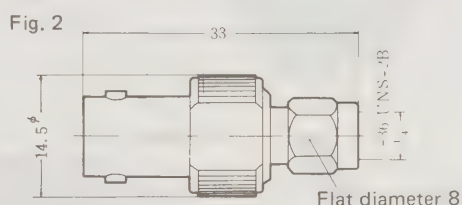
Part No.
* HRM-516
* HRM-516S
**HRM-516-1S

BNC series female —
HRM series female
* Split into two segments
** Integral



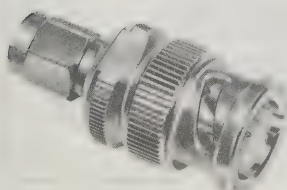
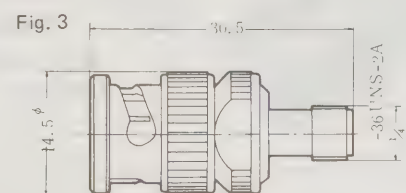
Part No.
* HRM-517
* HRM-517S
**HRM-517-1S

BNC series female —
HMR series male
* Split into two segments
** Integral



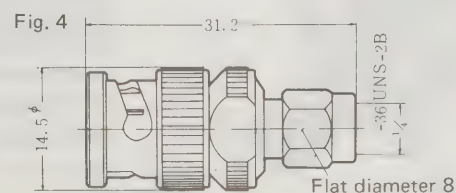
Part No.
* HRM-518
* HRM-518S
**HRM-518-1S

BNC series male —
HRM series female
* Split into two segments
** Integral

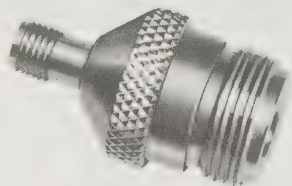


Part No.
* HRM-519
* HRM-519S
**HRM-519-1S

BNC series male —
HRM series male
* Split into two segments
** Integral

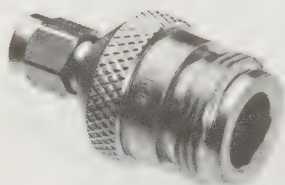
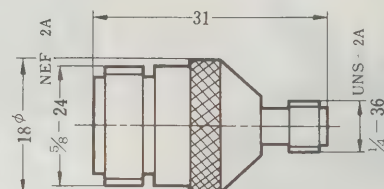


For N series



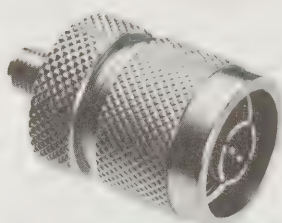
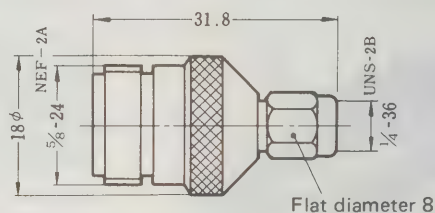
Part No.
HRM-552S

N series female —
HRM series female
Integral



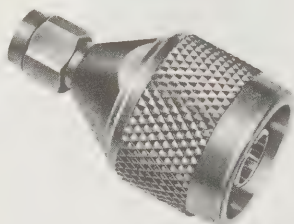
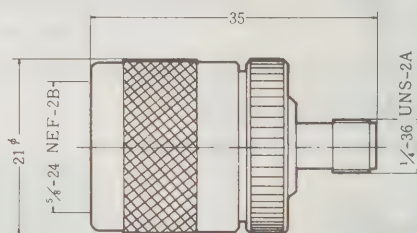
Part No.
HRM-553S

N series female —
HRM series male
Integral



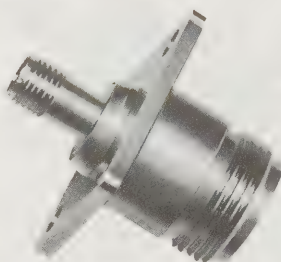
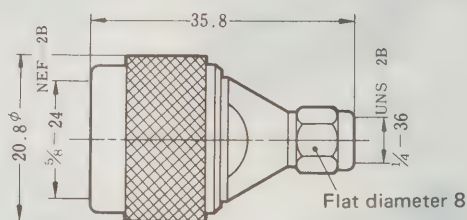
Part No.
HRM-554S

N series male —
HRM series female
Integral



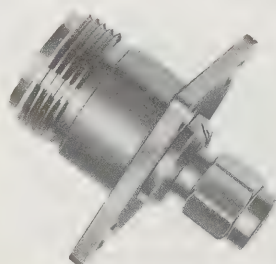
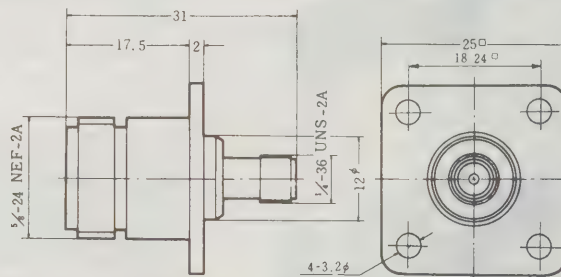
Part No.
HRM-555S

N series male —
HRM series male
Integral



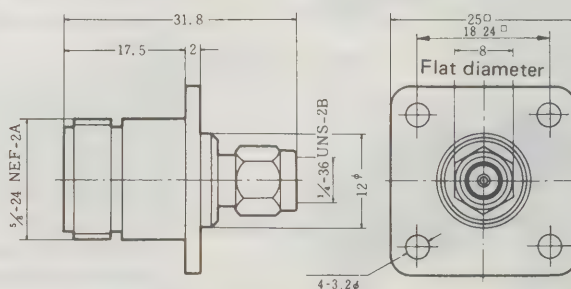
Part No.
HRM-556S

N series female
HRM series female
Panel adapter
Integral



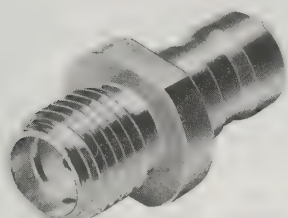
Part No.
HRM-557S

N series female —
HRM series male
Panel adapter
Integral



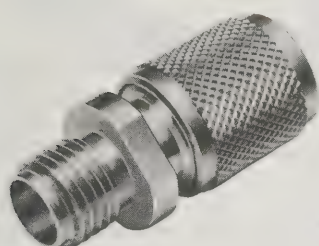
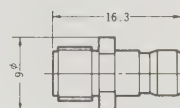
Conversion adapters

The following are adapters for connecting between the POB series and the HRM series:



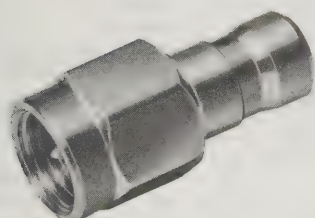
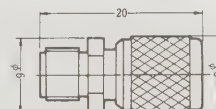
Part No.
HRMJ-POBJ

HRM series female —
POB series female



Part No.
HRMJ-POBP

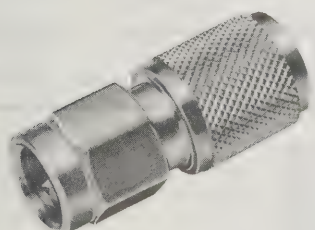
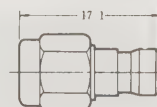
HRM series female —
POB series male



Part No.
HRMP-POBJ

HRM series male —
POB series female

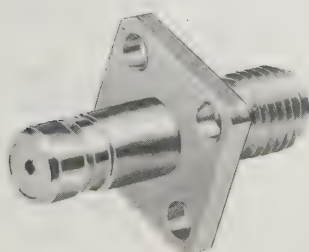
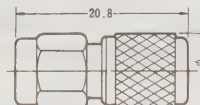
Flat diameter



Part No.
HRMP-POBP

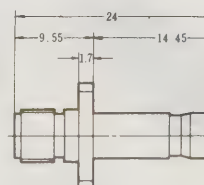
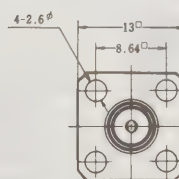
HRM series male —
POB series male

Flat diameter



Part No.
HRMJ-POBJ-PA

HRM series female —
POB series female
Panel adapter



Overview

SPO-type connectors are small, lightweight and inexpensive push-on's that were developed successfully through a thorough "V.A." investigation. Although their prices are about half those of the BNC type, they have excellent performance characteristics and can be used with frequencies of up to 3000MHz. There are two types, with characteristic impedances of 50Ω and 75Ω. The types are indicated by the final digits of the part number. The solderless system of connecting the wiring, has been adopted. The measuring cord connectors (3CV type) for NTT coaxial cables are the various types approved in NTT Standards No. 4172, First Edition.

The 3CV-type connectors allow ideal fits with the various types of connectors mounted in carrier devices. Despite their reduced sizes, they have high mechanical and electrical reliability. The connecting strength between the cables and connectors is high, and the connecting operation can be carried out easily.

3CV-type connectors with attached cables are also available. (They are described in Hirose catalog CA Series.)

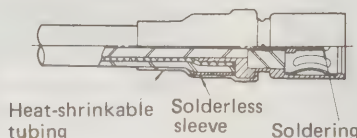
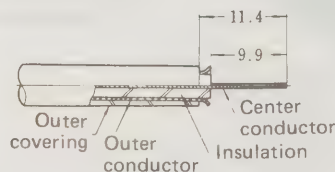
Main materials used Type SPO

Parts	Materials	Finish
Armor (shell)	Brass	Nickel plating
Male contact	Brass	Silver plating + surface treatment
Female contact	Phosphor bronze	Silver plating + surface treatment
Insulation	Tetrafluoride resin	

Main performance characteristics Type SPO

Items	Standard value
Contact resistance	5mΩ or less (at 1A DC)
Insulation resistance	1000MΩ or more at 500V DC
Withstand voltage	1000V AC (rms) for 1 minute
Characteristic impedance	50Ω • 75Ω

Connecting methods



The SPO-P-T solderless fixtures are sold by Hirose.

1. Process the cable ends in the manner shown in the drawing on the left.
2. Fold outer conductor back towards the outside.
3. Pass the diamond tubing and crimp sleeve (ferrule) over the cable.
3. Insert the shell assembly between the outer conductor of the cord and the insulation.
4. Return the ferrule (sleeve) to the prescribed position.
5. Crimp the ferrule (sleeve) with the proper hand tool and cut off any of the outer conductor which is left outside.
6. Solder the center contact to the center conductor of the cable. (Make sure that there is no solder build-up.)
7. Apply heat to the heat-shrinkable tubing at the position shown in the drawing.

Type-SPO plugs SPO-P

Part No.	Applicable cables
*SPO-P-50	3D-2V RG-55, 58/U
*SPO-P-75	3C-2V

*Standard product



SPO-P-50



Heat-shrinkable tubing



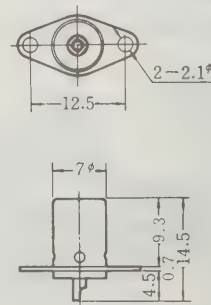
SPO-type receptacles SPO-R

Part No.
*SPO-R-50
*SPO-R-75

*Standard product



SPO-R-50



Main materials used 3CV type

Parts	Materials	Finish
Armor (shell)	Brass	Nickel plating
Outer conductor	Brass	Silver plating + surface treatment
Male contact	Brass	Gold plating
Female contact	Beryllium copper	Gold plating
Dielectric material	Tetrafluoride resin	

Main performance properties 3CV type

Items	Standard values
Contact resistance	5mΩ or less (at 1mV DC)
Insulation resistance	500MΩ or more at 500V DC
Withstand voltage	1000V AC (rms value) for 1 minute
Characteristic impedance	75Ω
Service life	The contact resistance after 1000 cycles is 10mΩ or less

Type 3CV plug 3CV-CP

Type-3CV jack 3CV-CJ



3CV-CP

Part No.	Applicable cable
*3CV-CP	3C-2V

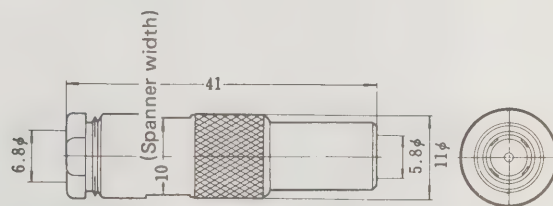
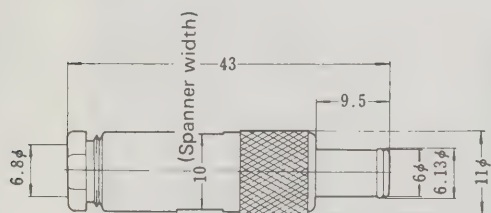
*Standard product



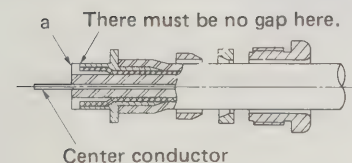
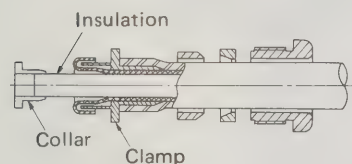
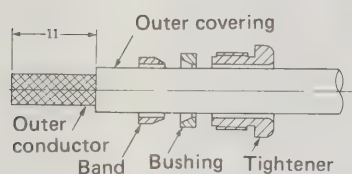
3CV-CJ

Part No.	Applicable cable
*3CV-CJ	3C-2V

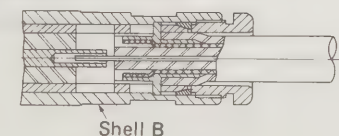
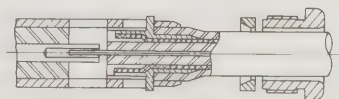
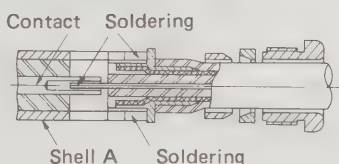
*Standard product



Connecting methods



1. Cut the outer covering as shown in the drawing on the left. (Be careful not to damage the outer conductor.)
2. Insert the clamp between the outer conductor and the outer covering. (Do not disentangle the outer conductor.)
3. Fold back the outer conductor, make a gap between the outer conductor and the insulation, and insert the collar.
4. Cut the outer conductor with a razor at the tip of the clamp, using the collar like a chopping board.
5. Cut the insulation on the "a" surface of the collar. (Be careful not to damage the center conductor).

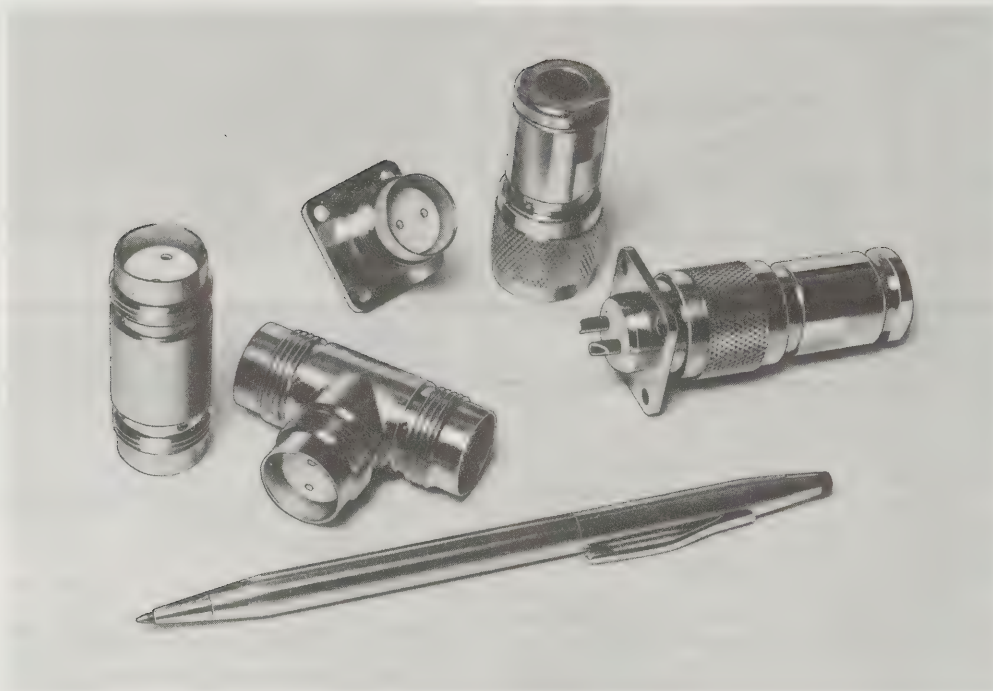


6. Insert the parts shown in the drawing above into shell A.
7. Align the slit of shell A with the slit of the clamp and solder them. Next, insert the soldering iron through the cut part of the shell, and solder the ends. (Perform the soldering rapidly.)
8. Place the band against the collar of the clamp, and tighten the band with a pair of pliers so that the pressure will be uniform around the circumference.
9. Insert the parts shown in the drawing above into shell B, and tighten the tightener securely all the way.

Coaxial two-core(TWT2)connectors

Overview

Coaxial two-core connectors are medium-sized, weather-resistant coaxial connectors of the screw coupling type, suitable for use with medium-sized coaxial two-core cables. They are interchangeable with products conforming to MIL standards (plug: UG-421B/U, receptacle: UG-422/U) and can be used for frequencies of up to 200MHz. They are suitable mainly for connections between computers and terminals.



Characteristic features

- (1) Most suitable for long- and medium-distance connections between computers and terminals, relay connections, and connections of VHF-band transmission equipment.
- (2) Most suitable for noise-proof transmission.
- (3) High-performance connectors that can be used for frequencies of up to 200MHz.
- (4) Interchangeable with products conforming to MIL standards.

MRF SERIES RF CO-AXIAL CONNECTORS

Materials, finish

Part	Materials	Finish
Armor (shell)	Brass	Nickel plating
Center contact (male)	Brass	Silver plating + surface treatment
Center contact (female)	Beryllium copper	Silver plating + surface treatment
Insulation	Synthetic resin	
Rubber packing	Silicone rubber	

Performance characteristics

Items		Performance characteristics
Electrical characteristics	Insulation resistance	1000M Ω or higher when measured at 500V DC between the center contacts and between the center and outer contacts.
	Withstand voltage	1500V AC (rms) for 1 minute between the center contacts and between the center and outer contacts.
	Contact resistance	4m Ω or less at center contacts and at outer contacts.
	Characteristic impedance	95 Ω
Mechanical characteristics	Contact service life	After 1000 times insertions and withdrawals, the contact resistance must be 10m Ω or less at center contacts and at outer contacts.
	Holding force of center contact	100g or more
	Cable clamping force	10kg or more
Environmental characteristics	Temperature cycles	There must be no abnormalities when tested by Method 102A, MIL-STD-202E, under test condition D.
	Vibration resistance	There must be no abnormalities when tested by Method 210A, MIL-STD-202E.
	Impact resistance	There must be no abnormalities when tested by Method 213B, MIL-STD-202E, under test condition A.
	Humidity resistance (Temperature-humidity cycles)	There must be no abnormalities when tested by Method 106D, MIL-STD-202E.
	Corrosion resistance	There must be no abnormalities when tested by Method 101D, MIL-STD-202E, under test condition B.

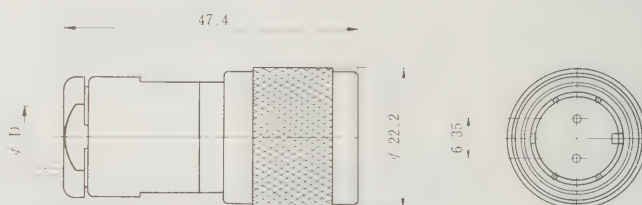
MRF SERIES RF CO-AXIAL CONNECTORS

1. Plugs



Part No.	Applicable cables	ϕD
* TWT2-P	Special two-core coaxial cables (manufactured by Sumitomo Electric Industries, Ltd.)	9.5
TWT2-P-22/U	RG-22B/U	11.2

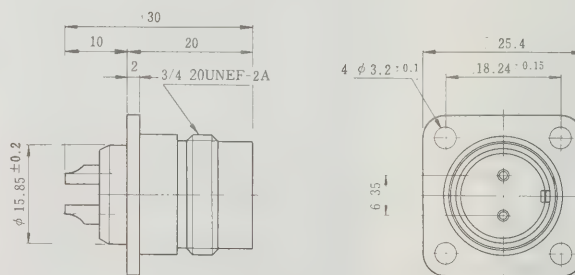
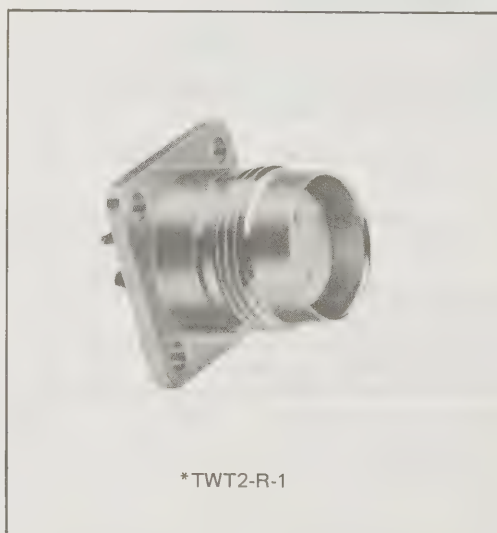
*Standard product



Screw dimensions at fitting part
3/4-20UNEF-2B

TWT2-P

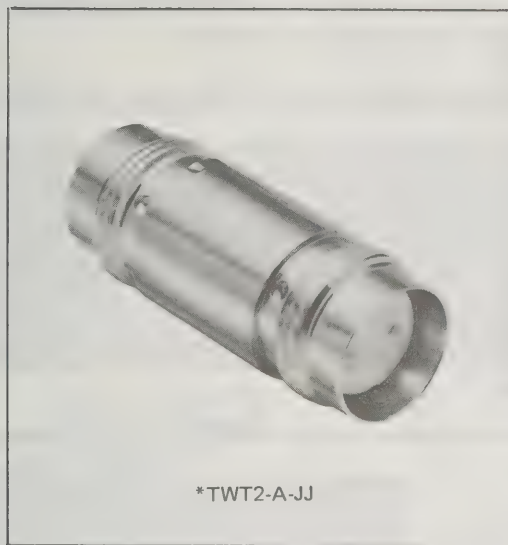
2. Receptacle



TWT2-R-1

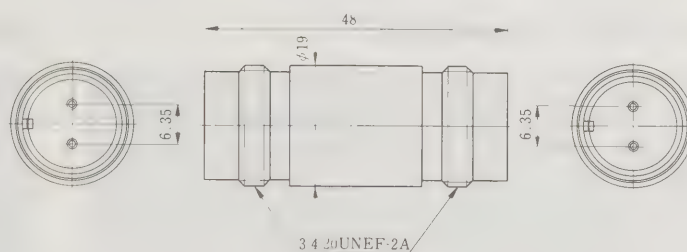
*Standard product

3. Linear adapter



*TWT2-A-JJ

*Standard product



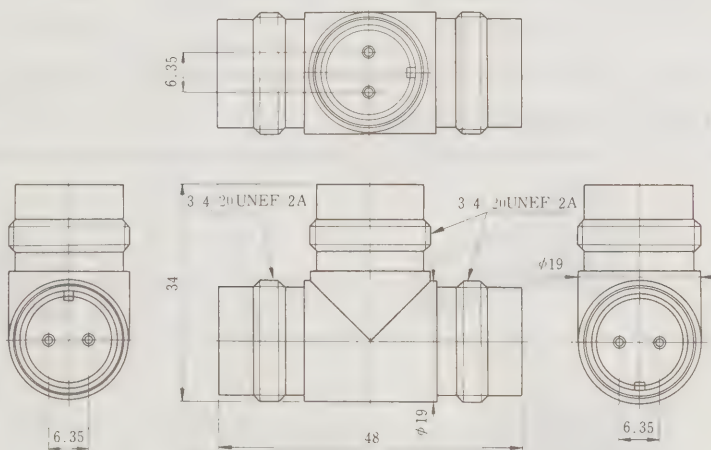
TWT2-A-JJ

4. T-type adapter



*TWT2-TA-JJJ

*Standard product



TWT2-TA-JJJ

Overview

- The UM (Ultra-Miniature) series consists of ultrasmall-size coaxial connectors that are most suitable for very thin coaxial cables having a high reliability.
- Two types of lock are available: the screw-lock type and the quick-lock type. The quick-lock type has been approved in Defense Agency standards NDS XC6115 and DSP C6205.
- Two connecting methods are available: the solderless connecting system, in which the simplicity and accuracy of the work of connecting the wiring is greatly increased; and the screw-clamp system, in which wires can be connected accurately.
- The types for mounting printed circuit boards are constructed so that they can be mounted directly by soldering onto the printed circuit boards.

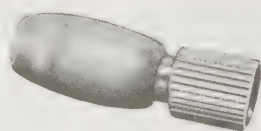
Main materials used

Part	Materials	Finish
Shell	Brass	Gold plating
Male contact	Brass	Gold plating
Female contact	Beryllium copper	Gold plating
Insulation	Tetrafluoride resin	

Main performance characteristics

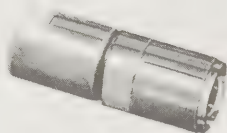
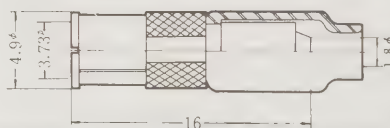
Items	Standard value
Contact resistance	5mΩ or less (at 1A DC)
Insulation resistance	1000MΩ or more at 500V DC
Withstand voltage	500V AC (rms) for 1 minute
Characteristic impedance	50Ω
Voltage standing wave ratio	1.2 or less at DC ~ 1000MHz

UM-P plugs



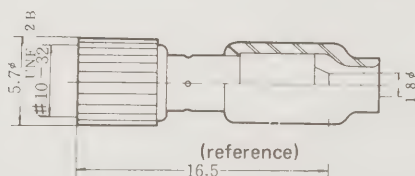
UM-SP-1.5

Fig. 1



UM-QP-196/U

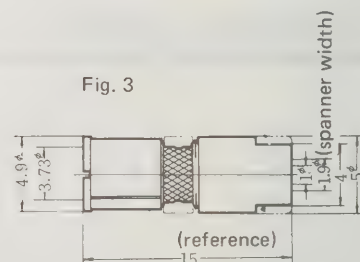
Fig. 2



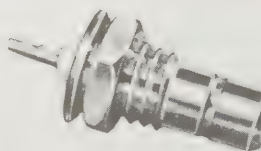
Part No.	Applicable cables	Remarks
*UM-QP-1.5	1.5D-2V	Fig. 1
*UM-SP-1.5	1.5D-2V	Fig. 2
*UM-QP-196/U	RG-196/U	Fig. 3

*Standard product

Fig. 3

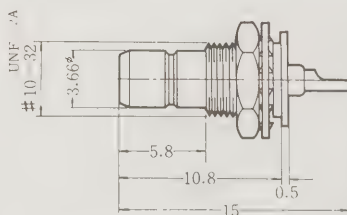


UM-R receptacles



UM-QR

Fig. 4



UM-SR

Fig. 5

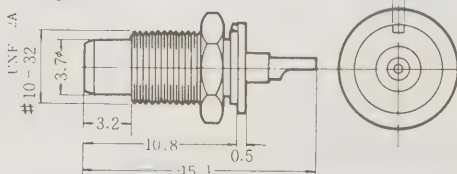
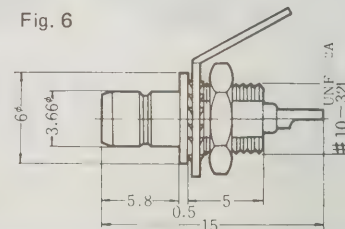


Fig. 6



Part No.	Remarks
*UM-QR	Fig. 4
*UM-SR	Fig. 5
*UM-QR-1	Fig. 6

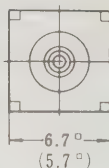
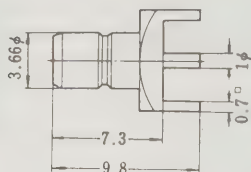
*Standard product

RF CO-AXIAL CONNECTORS

Receptacles (type for mounting printed circuit boards)



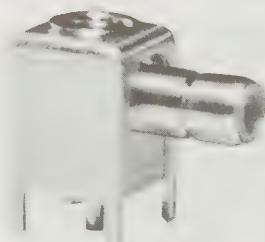
UM-R-PC



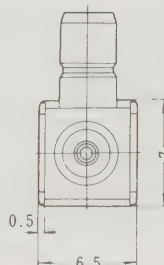
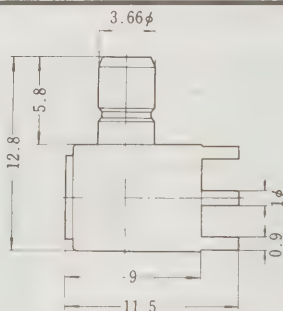
Part No.	Remarks
UM-R-PC	6.7 [□]
UM-R-PC-1	5.7 [□]

Models with the dimension shown in parenthesis are also available.

L-type receptacle (type for mounting printed circuit boards)



UM-LR-PC



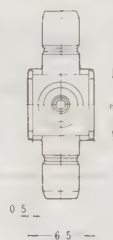
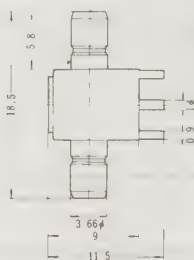
Part No.
*UM-LR-PC

*Standard product

T-type receptacle (type for mounting printed circuit boards)



UM-TR-PC



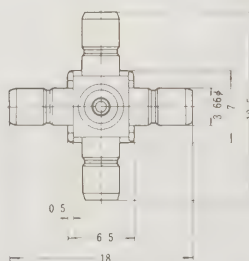
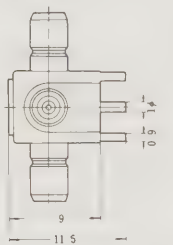
Part No.
UM-TR-PC

UM-TR-PC

Four-way branched receptacle (type for mounting printed circuit boards)



UM-CR-PC



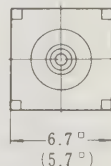
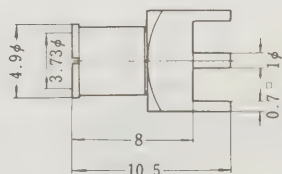
Part No.
UM-CR-PC

UM-CR-PC

Plug receptacle (type for mounting printed circuit boards)



UM-PR-PC



Part No.
*UM-PR-PC

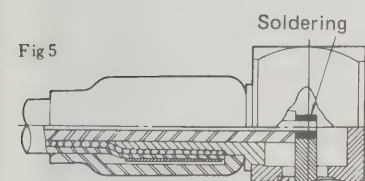
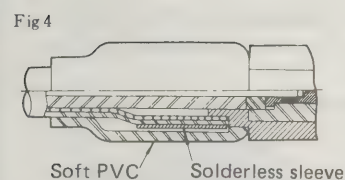
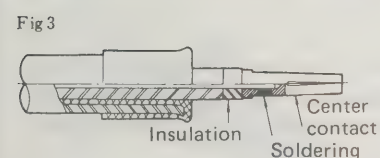
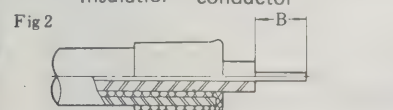
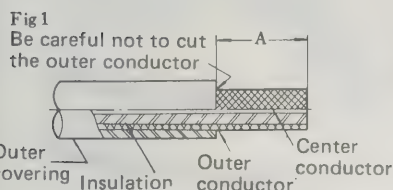
Models with the dimension shown in parenthesis are also available

* Standard product

Connecting methods

Solderless connecting system

Part No.	A	B
UM-QP -1.5	4.7	2.7
UM-QLP-1.5	4.7	1.1
UM-QJ -1.5	4.7	2.7
UM-QPJ-1.5	4.7	2.7



1. Cut the outer covering as shown in the drawing on the left.
2. Insert the soft PVC and solderless sleeve, in that order, onto the cable. Fold back the outer conductor, and cut the insulator to obtain the dimensions indicated in B.
3. Insert the insulation into the center conductor of the cable. Next insert the center conductor into the center contact and solder it. (Be careful to avoid any solder build-up.)
4. Insert this block into the plug. Insert the solderless sleeve, and crimp it with the proper tool. (As indicated) Cut off any of the outer conductor which is left outside the solderless sleeve at this time.

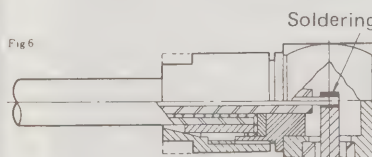
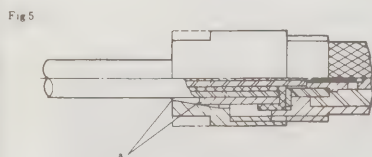
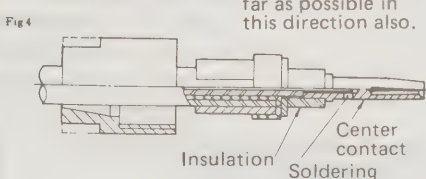
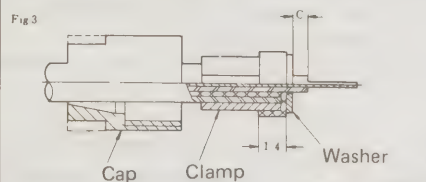
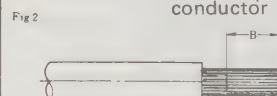
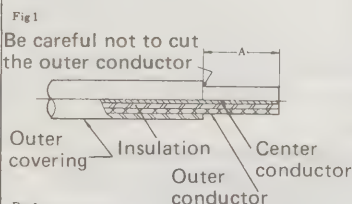
Note: In the case of UM-QP-1.5, it is advisable to insert this block into the plug with the plug locator (UM-QP-T) fitted into position.

Dedicated fixture UM-MSS-T-1

5. Finally, insert the soft PVC.
6. In UM-QLP-1.5, after everything has been done up to Fig. 2, insert into the plug and then perform 4 and 5.
7. Put the cable core into the split part of the center contact and solder it. (Be careful to avoid any solder build-up.)

Clamping system

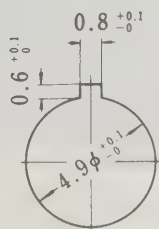
Part No.	A	B	C
UM-QP -196/U	4.0	2.7	1.0
UM-QLP-196/U	6.5	1.1	5.0
UM-QJ -196/U	4.0	2.7	1.0
UM-QPJ-196/U	4.0	2.7	1.0



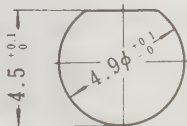
1. Cut the outer covering as shown in the drawing on the left.
 2. Disentangle the outer conductor, and cut the insulation as shown in the drawing on the left.
 3. Pass the cable through the cap, insert the clamp, and fold back the outer conductor as is shown in the drawing on the left. Cut the outer conductor at 1.4mm after inserting the washer. (The C dimensions are approximately the dimensions given in the table above.) (Tighten the clamp in the direction of the split.)
 4. Insert the insulation in front of the washer, insert the center contact into the core of the cable, and solder it. (Be careful to avoid any solder build-up.)
 5. Insert the insulation.
 6. Insert this block into the plug and tighten the cap until they match at part "a."
- Note: In the case of UM-QP-196/U, it is advisable to insert this block into the plug with the plug locator (UM-QP-T) fitted into position.
7. In UM-QLP-196/U, after everything has been done up to Fig. 3, insert into the plug and then tighten the cap thoroughly.
 8. Put the cable core into the split part of the center contact and solder it. (Be careful to avoid any build-up of solder.)

Drawings of holes drilled for panel mounting

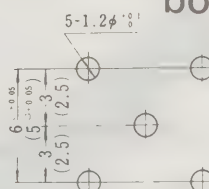
Mounting holes for
UM-QR,
UM-QPJ-1.5,
UM-SR,
UM-SPJ-1.5,
UM-QPJ-196/U,



Mounting holes
for UM-QR-1



For printed circuit
boards



UM-P-PC and UM-PR-PC are also available with the dimensions given in parenthesis.

UM SERIES RF CO-AXIAL CONNECTORS

UM(solderless) CR-type plugs Newly added varieties of UM receptacles

Overview

Solderless CR-type plugs have recently been developed in the UM series, and new varieties of receptacles have been added to enlarge the UM series.

These connectors are interchangeable with the UM series of the past (corresponding to the connectors approved in NDS XC 6115 and the MIL C39012 SMB connectors), which have already been highly evaluated for their performance and quality in products such as wired and wireless communication equipment, broadcasting equipment, electronic instrumentation, etc. The new connectors have performance characteristics equal or superior to theirs.



Characteristic features

- (1) In the straight plugs, the center and outer conductors have solderless wiring connections. In the L-type plugs, the outer conductors have solderless wiring connections. This reduces the work required to connect the wiring and ensures consistent quality.
- (2) The lock-spring parts of the couplings are protected by outer cylinders, resulting in consistent mechanical and electrical quality.
- (3) They are compact in size and lightweight. The range of applicable cables is larger, and the high-frequency performance characteristics are also excellent (1.2 or less at frequencies up to 1.5GHz).
- (4) New design makes the connectors easier to use and highly economical.

Main materials used

Parts	Materials	Finish
Armor (shell)	Brass	Nickel plating
Male contact	Brass	Silver plating
Female contact	Phosphor bronze	Silver plating
Insulation	Hard polyethylene	—
Winding spring at fitting part	Beryllium copper	Nickel plating
Cord covering	Crosslinked polyolefin	—
Toothed washer	Phosphor bronze	Nickel plating

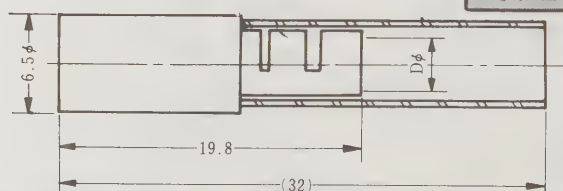
Main performance characteristics

Items	Standard value
Contact resistance	5 mΩ or less (at 1 A DC) (center and outer contacts)
Insulation resistance	1000 MΩ or more at 500V DC
Withstand voltage	500V AC (rms) for 1 minute
Characteristic impedance	1.2 or less at DC ~ 1500MHz
Voltage standing wave ratio	50 Ω
Coupling force (withdrawing force)	Outer: 0.8 kg or more Center: 50 g or more
Bonding strength	Outer: 5 kg or more Center: 2.5 kg or more

Plugs UM-QP-() CR



UM-QP-1.5CR



Part No.	Applicable cables	Dφ
*UM-QP-1.5CR	1.5D-2V, 1.5D-XV	3.5
*UM-QP-2.5CR	2.5D-2V, 2.5C-2V	3.8

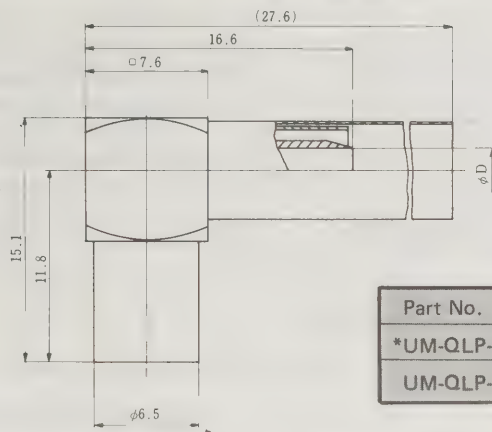
*Standard product

UM SERIES RF CO-AXIAL CONNECTORS

L-type plugs UM-QLP-() CR



UM-QLP-1.5CR3



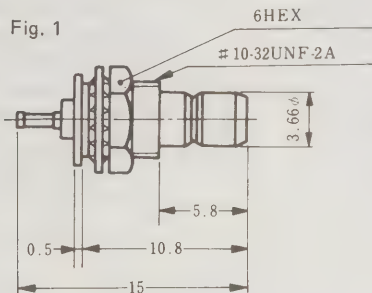
Part No.	Applicable cables	Dφ
*UM-QLP-1.5CR3	1.5D-2V, 1.5D-XV	1.8
UM-QLP-2.5CR3	2.5D-2V, 2.5C-2V	2.8

*Standard product

Receptacles UM-QR-()



UM-QR-5



UM-QR-5 mounting hole

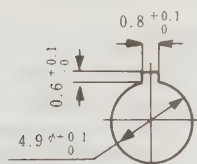
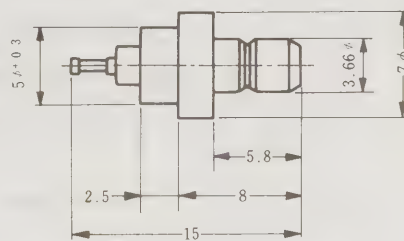


Fig. 2



Part No.	Panel thickness	Remarks
*UM-QR-5	0.8 ~ 2.5mm	Fig. 1
*UM-QR-6	0.8 ~ 2.5mm	Fig. 2

*Standard product

Note: The insulation of UM-QR-6 is made of tetrafluoride resin.

Connecting tools

Applicable cables	Part No.	Names of tools used	
		For center conductors	For outer conductors
1.5D-2V	UM-QP-1.5CR	UM-CR-T-1	UM-CR-T-3
2.5D-2V	UM-QP-2.5CR	UM-CR-T-1	
2.5C-2V	UM-QP-2.5CR	UM-CR-T-1	
1.5D-2V	UM-QLP-1.5CR3	—	UM-MSS-T-1
2.5D-2V	UM-QLP-2.5CR3	—	
2.5C-2V	UM-QLP-2.5CR3	—	

UM-CR-T-1



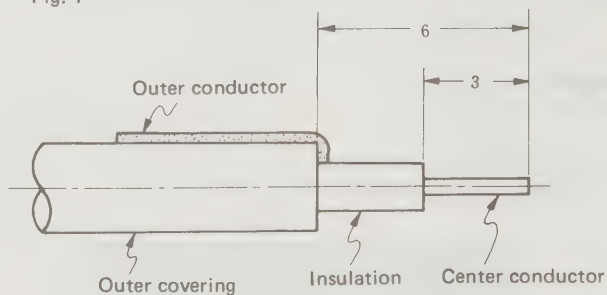
UM-CR-T-3



Connection dimensions

1. UM-QP-1.5CR

Fig. 1

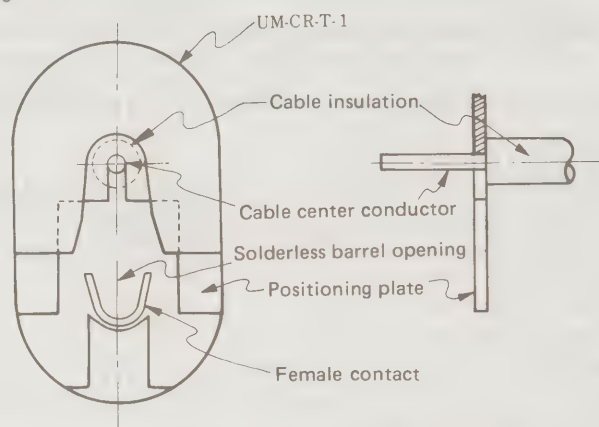


(1) Cable end processing Fig. 1

- i) Process the cable ends as shown in Fig. 1. When folding back the outer conductor of the cable, gather it together into one bunch.

Note 1: Be careful not to damage the outer conductor or center conductor of the cable.

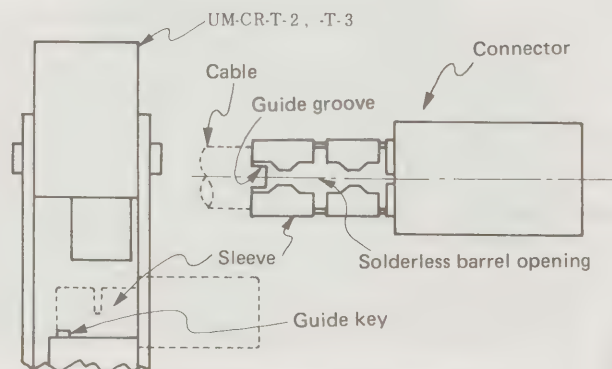
Fig. 2



(2) Connecting wiring of center conductor Fig. 2

- i) Insert the female contact as shown in Fig. 2 into the center conductor crimp tool (UM-CR-T-1), with the opening of the barrel facing upwards, until the tip of the female contact (the coupling part side) comes into contact with the tool.
- ii) Insert the cable as shown in Fig. 2 into the center conductor tool until the insulation of the cable strikes against the positioning plate of the tool.
- iii) Move the handle to the position where the ratchet mechanism of the tool becomes disconnected, and make the connections.

Fig. 3



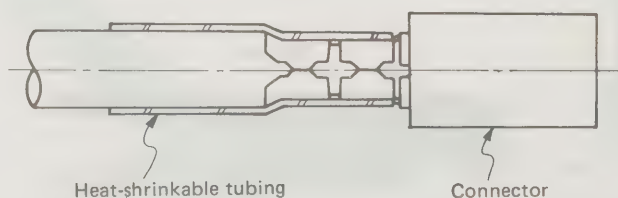
(3) Connecting wiring of outer conductor Fig. 3

- i) Insert the cable into the connector so that the folded outer conductor of the cable, to which the female contact is connected, will be positioned in a 90° direction either to the left or to the right of the barrel opening of the connector sleeve (do not position it directly over or directly under the opening).
- ii) Mount the connector on the tool of the outer conductor, as shown in Fig. 3.
- iii) Move the handle until the tool makes a ratchet sound, and make the connections.

Note 2: Be sure that the guide key of the tool goes into the guide groove of the connector sleeve.

Note 3: The crimp tool used when connecting the wiring of 1.5D-XV and 1.5D-2V is UM-CR-T-3.

Fig. 4

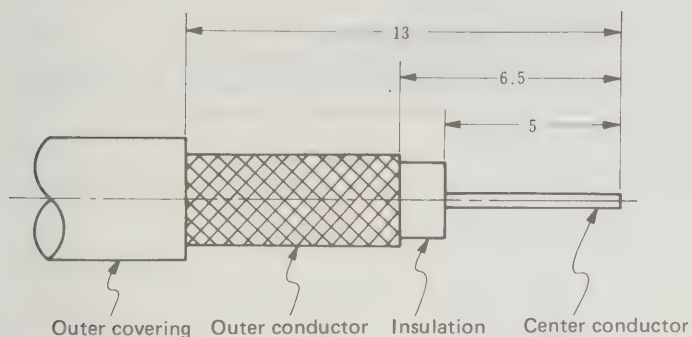


(4) Mounting the heat-shrinkable tubing Fig. 4

- i) Mount the heat-shrinkable tubing in the connector.
- ii) Heat the heat-shrinkable tubing with a heat gun or the like.

2. UM-QP-2.5CR

Fig. 1



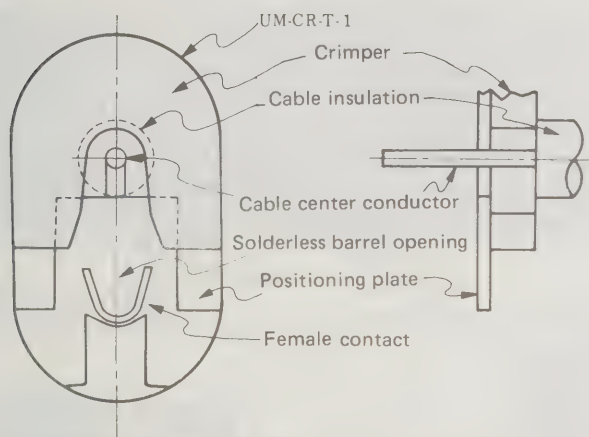
(1) Cable end processing Fig. 1

i) Process the cable ends as shown in Fig. 1.

Note 1: Be careful not to damage the outer conductor or center conductor of the cable.

Note 2: Be careful not to unbraid the outer conductor of the cable.

Fig. 2



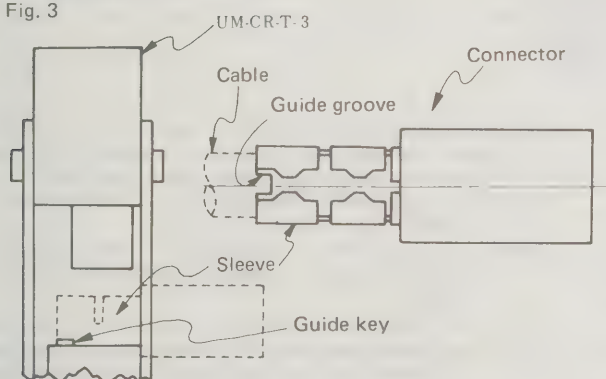
(2) Connecting wiring of center conductor Fig. 1

i) Insert the female contact as shown in Fig. 2 into the center conductor tool (UM-CR-T-1) until its tip (the coupling part side) comes into contact with the tool.

ii) Insert the cable as shown in Fig. 2 into the tool until the insulation of the cable strikes against the crimper of the tools.

iii) Move the handle to the position where the ratchet mechanism of the tool becomes disconnected, and make the connections.

Fig. 3



(3) Connecting wiring of outer conductor Fig. 3

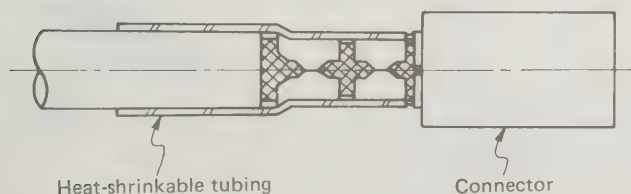
i) Insert the cable, to which the female contact is connected, into the connector.

ii) Insert the connector into the tool (UM-CR-T-3), as shown in Fig. 3.

Note 3: Be sure that the guide key of the tool goes into the guide groove of the connector sleeve.

iii) Move the handle until the tool makes a ratchet sound, and make the connections.

Fig. 4

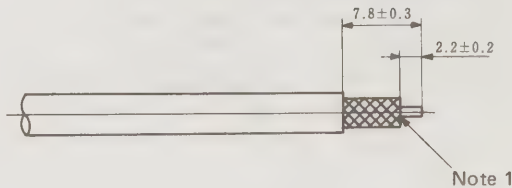


(4) Mounting the heat-shrinkable tubing Fig. 4

i) Mount the heat-shrinkable tubing in the connector.

ii) Heat the heat-shrinkable tubing with a heat gun or the like.

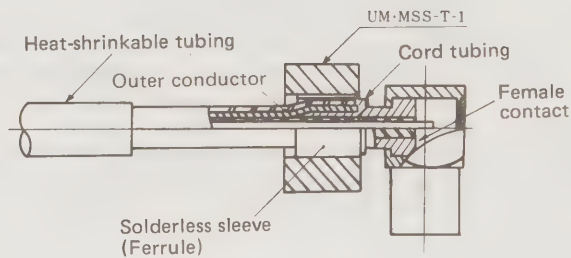
3. UM-QLP-「 JCR3



(1) Cable end processing Fig. 1

- i) Process the cable end as shown in the drawing 1.

Note 1: Be carefull not to damage the outer conductor or center conductor of the cable.

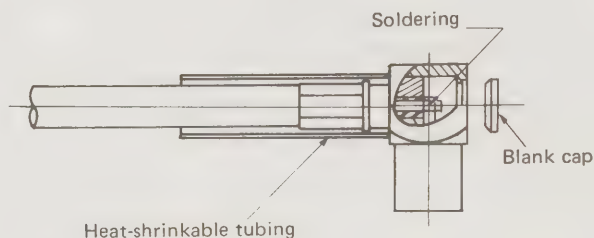


(2) Connecting wiring of outer conductor Fig. 2

- i) Insert the heat-shrinkable tubing and the solderless sleeve into the cable.
- ii) Insert the cable into the connector so that the outer conductor of the cable strikes against the female contact.
- iii) Insert the solderless sleeve into the cord tubing (*1), and crimp it in hexangle with the proper tool (UM-MSS-T-1). Cut off any of the outer conductor which is left outside the solderless sleeve at that time.

(*1) 1.5D-2V indicates the 1.5 hole.

2.5D-2V } indicate the 2.5 hole.
2.5C-2V }



(3) Connecting wiring of center conductor Fig. 3

- i) Solder the center conductor of the cable to the male contact of the connector as shown in drawing 3.

Note 1: Recommendable temperature of soldering iron is 30W.

Note 2: Clean up (blow) inside by air in order that insulation or withstand voltage defection will not take place.

- a) Press the blank cap to the connector with the round bar of $\phi 5.4$ using drilling machine, arbor press etc., as shown in the drawing on the left.
- b) Mount the heat-shrinkable tubing in the connector and heat it with a heat gun or the like.

MSS SERIES RF CO-AXIAL CONNECTORS

Overview

As microelectronic equipment has been adopted more and more in the electronic industry, electronic circuits are being converted to those of the unit type, modular type and integrated type. Foreseeing this trend, our company made use of the latest technology of high-frequency connectors and developed the ultrasmall high-frequency connectors of the MSS (micro-slide-snap) series. (Registered Utility Model Nos. 882197 and 923632)

- MSS is approved in the Defense Agency's standards NDS XC 6120 and DSP C6206.
- MSS displays its individuality in all respects. Although the connectors have been highly miniaturized in their size, they have performance properties which fully rival those of medium-sized high-frequency connectors. Since the slide-snap lock system is adopted, more or less perfect surface contacts are achieved in both the inner and outer conductors, while at the same time superior vibration-resistance properties are displayed.
- Two types of MSS are available: the solderless connecting system, in which the simplicity and accuracy of the work of connecting the wiring is greatly increased; and the screw-clamp system, which makes it possible to connect the wiring accurately.
- The MSS types match mainly the 1.5D-2V and 2.5D-2V cables. The MSS1 type was developed for RG-55/U cables. It is the same as the MSS types in its shapes, materials and performance characteristics. However, please note that it is one size larger than the MSS types and hence is not interchangeable with the MSS types.
- The types for printed circuit boards are constructed so as to be mountable by soldering directly onto the printed circuit boards.

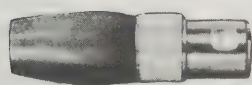
Materials, finish

Parts	Materials	Finish
Shell	Brass	Gold plating
Male contact	Brass	Gold plating
Female contact	Beryllium copper	Gold plating
Insulation	Tetrafluoride resin	
Lock spring	Beryllium copper	Nickel plating

Main performance characteristics

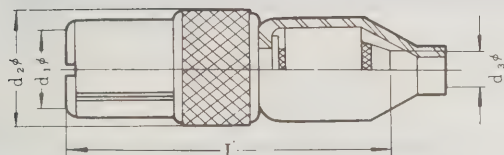
Items	Standard value
Contact resistance	5mΩ or less (at 1A DC)
Insulation resistance	2000MΩ or more at 500V DC
Withstand voltage	500V AC (rms) for 1 minute
Characteristic impedance	50Ω
Voltage standing wave ratio	1.2 or less at DC ~ 2000MHz

MSS-P plugs



MSS-P-2.5

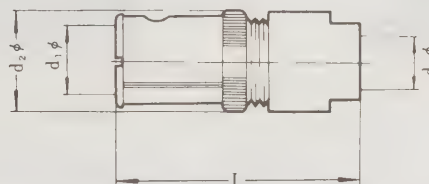
Fig. 1



Part No.	Applicable cables	d ₁ φ	d ₂ φ	d ₃ φ	L	Remarks
*MSS-P-1.5	1.5D-2V, RG-174/U	4.65	7.5	1.8	20.5	Fig. 1
*MSS-P-2.5	2.5D-2V	4.65	7.5	2.8	20.5	Fig. 1
MSS1-P-55/U	RG-55/U	5.65	8.5	3.2	24.0	Fig. 1
*MSS-P-1.5-A	1.5D-2V	4.65	6.5	3.4	16.0	Fig. 2
MSS-P-196/U	RG-196/U	4.65	6.5	1.9	16.0	Fig. 2

*Standard product

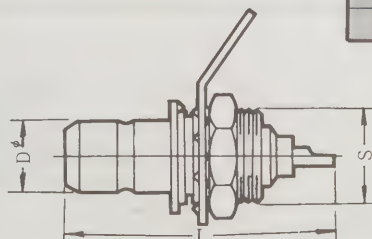
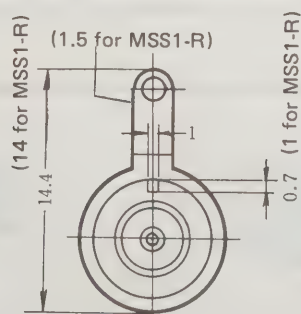
Fig. 2



MSS-R receptacles



MSS-R

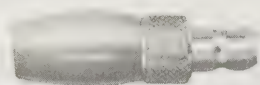


Part No.	D φ	L	S
*MSS-R	4.6	17.9	M6x0.75
MSS1-R	5.6	19.8	M6x0.5

*Standard product

MSS SERIES RF CO-AXIAL CONNECTORS

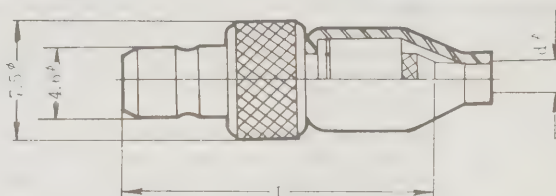
MSS-J jacks



MSS-J-2.5

Part No.	Applicable cables	$d\phi$	L
*MSS-J-1.5	1.5D-2V, RG-174/U	1.8	20.6
MSS-J-2.5	2.5D-2V	2.8	20.6

*Standard product

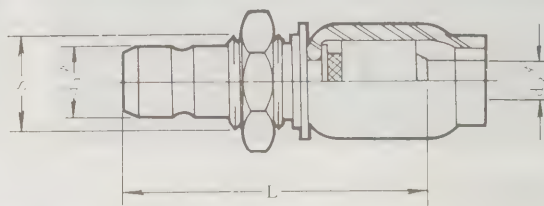


MSS-PJ panel jacks



MSS-PJ-2.5

Part No.	Applicable cables	$d_1\phi$	$d_2\phi$	S	a	L
MSS-PJ-2.5	2.5D-2V	4.6	2.8	M6x0.75	7.5	20.4
MSS1-PJ-55/U	RG-55/U	5.6	3.2	M7x0.75	9.0	23.2



MSS-LP L-type plugs



MSS-LP-2.5

Part No.	Applicable cables	$d_1\phi$	$d_2\phi$	l_1	l_2	Remarks
*MSS-LP-1.5	1.5D-2V, RG-174/U	1.8	4.65	19.0	15.5	Fig. 3
*MSS-LP-2.5	2.5D-2V	2.8	4.65	19.0	15.5	Fig. 3
MSS1-LP-55/U	RG-55/U	3.2	5.65	19.5	16.5	Fig. 3
*MSS-LP-1.5-A	1.5D-2V	3.4	4.65	15.0	15.5	Fig. 4
MSS-LP-196/U	RG-196/U	2.3	4.65	15.0	15.5	Fig. 4

*Standard products

Fig. 3

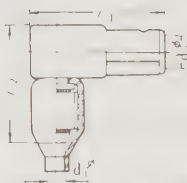
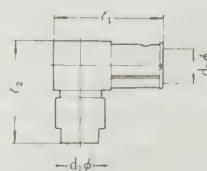


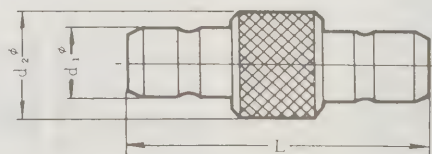
Fig. 4



MSS-A linear adapters



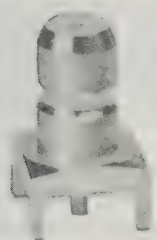
MSS-A-JJ



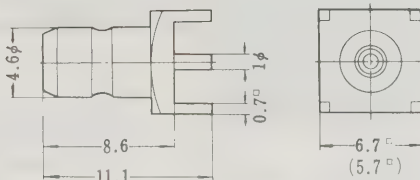
Part No.	$d_1\phi$	$d_2\phi$	L
MSS-A-JJ	4.6	7	19

MSS SERIES RF CO-AXIAL CONNECTORS

Receptacle (Types for mounting printed circuit boards)



MSS-R-PC



Part No.

* MSS-R-PC

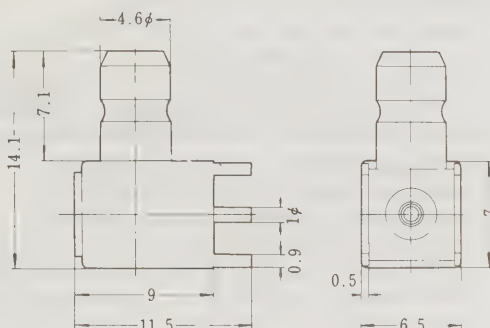
Those with the dimension enclosed in parenthesis are also available.

* Standard product

L-type receptacle (Types for mounting printed circuit boards)



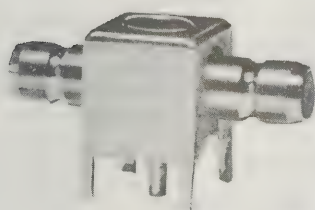
MSS-LR-PC



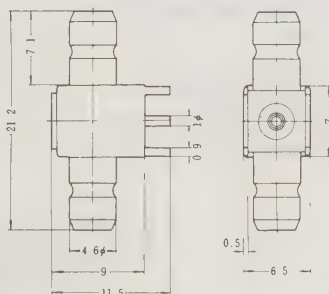
Part No.

MSS-LR-PC

T-type receptacle (Types for mounting printed circuit boards)



MSS-TR-PC



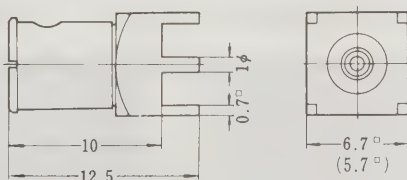
Part No.

MSS-TR-PC

Four-way branched receptacle (Types for mounting printed circuit boards)



MSS-PR-PC



Part No.

MSS-PR-PC

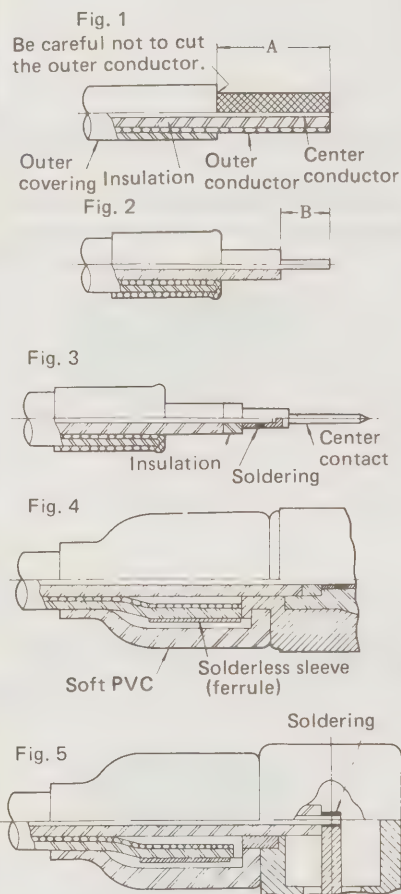
Those with the dimensions enclosed in parenthesis are also available.

MSS SERIES RF CO-AXIAL CONNECTORS

Connecting methods

Solderless Connecting system

Part No.	A	B
MSS-P-1.5	5.8	2.6
MSS-P-2.5	5.8	1.7
MSS-J-1.5	7.4	3.3
MSS-LP-1.5	5.8	2.0

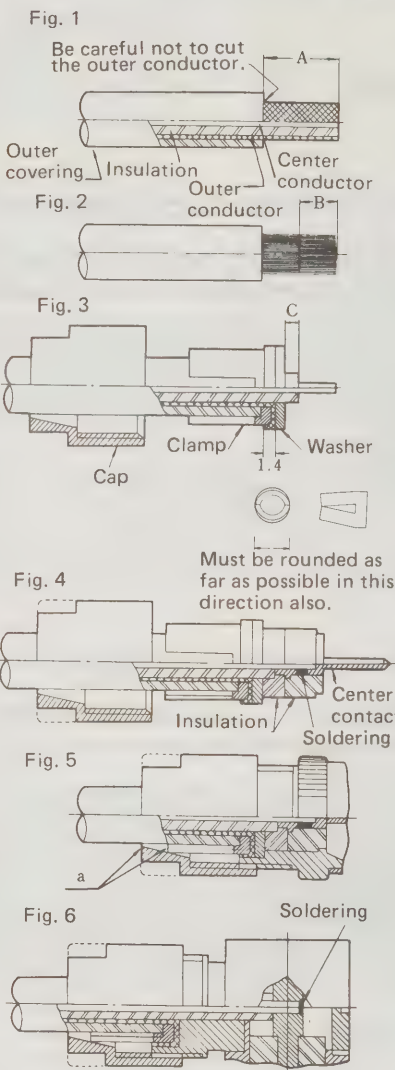


1. Cut the outer covering as shown in the drawing on the left.
2. Insert the soft PVC and ferrule, in that order, onto the cable. Fold back the outer conductor, and cut the insulator to obtain the dimensions indicated in B.
3. Insert the insulation into the center conductor of the cable. Next insert the center conductor into the center contact and solder it. (Be careful to avoid any solder build-up.)
4. Insert this block into the plug. Insert the solderless sleeve, and Crimp it with the proper tool. Cut off any of the outer conductor which is left outside the ferrule at that time.*¹
5. Finally, insert the soft PVC.
6. In MSS-LP-1.5, after everything has been done up to Fig. 2, insert into the plug and then perform 4 and 5.
7. Put the cable core into the split part of the center contact and solder it. (Be careful to avoid any solder build-up.)

*¹ Tool recommended: UM-MSS-T-1

Clamping system

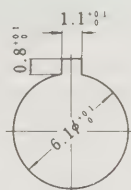
Part No.	A	B	C
MSS-P-1.5-A	4.0	2.0	0.7
MSS-LP-1.5-A	7.1	1.5	5.3



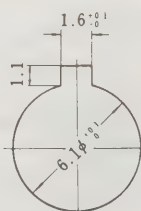
1. Cut the outer covering as shown in the drawing on the left.
2. Disentangle the outer conductor, and cut the insulation at dimension B.
3. Pass the cable through the cap, insert the clamp, and fold back the outer conductor as is shown in the drawing on the left. Cut the outer conductor at 1.4mm after inserting the washer. (The C dimensions are approximately the dimensions given in the table above.) (Tighten the clamp in the direction of the split.)
4. Insert the insulation in front of the washer, insert the center contact into the core of the cable, and solder it. (Be careful to avoid any solder build-up.)
5. Insert the insulation.
6. Insert this block into the plug and tighten the cap until they match at part "a".
7. In MSS-LP-1.5-A, after everything has been done up to Fig. 3, insert into the plug and then tighten the cap thoroughly.
8. Put the cable core into the hole in the center contact and solder it. (Be careful to avoid any solder build-up.)

Drawings of holes drilled for panel mounting

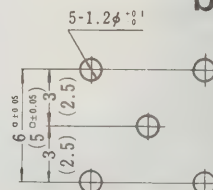
Mounting holes for MSS-R, MSS-PJ-2.5



Mounting holes for MSS1-R



For printed circuit boards



MSS-P-PC and MSS-PR-PC are also available with the dimensions given in the parenthesis.

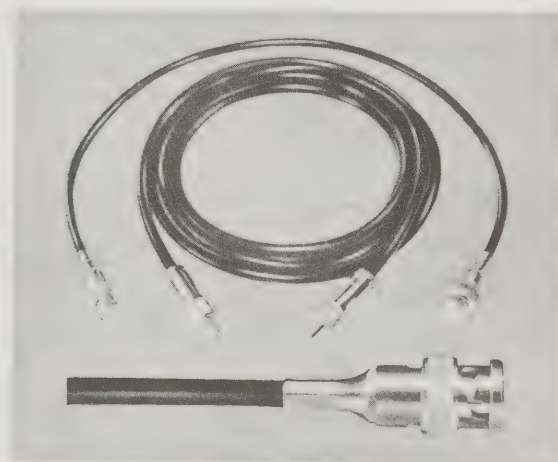
CA SERIES RF CO-AXIAL CONNECTORS

Overview

Making electronic equipment highly reliable has recently become an important problem, and connectors are no exception. As is well known, the reliability and stability of connectors are more or less determined by the reliability of the wiring connections.

BB-X, which is introduced here, is an improved product in which BNC-type plugs (equivalent to UG-88/U), which have special clamps attached to both ends of RG-58C/U high-frequency cables, are connected in order greatly to increase the cable clamping force.

The measuring cords for testing, which have been approved in the specifications for measuring cords for NTT coaxial cables (NTT Standards No. 4172, 1st edition), consist of 3C-2V cords to which the 3CV type (Standard No. 4172, 1st edition, connector units, listed in our catalog PO series) or 3C type (Standard No. 2095, 2nd edition, listed in our catalog BNC series) is attached.



Characteristic features

BB-X

- (1) They have a high reliability in which the high-frequency characteristics and contact resistance do not change even when the connectors and cables are subjected to torsion, tension, strong vibrations and impacts from outside sources.
- (2) Since they are manufactured as testing cords, consisting of cables of a specified length to which connectors are attached, they are very useful as coaxial cables with connectors for measuring instruments.
- (3) The wiring in the connected state in actual use has characteristic features which are clear.

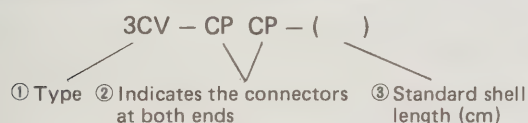
Type 3CV

- (1) The surface treatment of the electrically continuous parts is gold or silver plating, and that of the shell parts is nickel plating. This results in outstanding corrosion resistance with unimpaired electrical performance properties.
- (2) The connecting strength between the cords and the connectors is high.
- (3) There is a standard cord length. This is extremely valuable in use.

Type Type 3CV

(1) CABLE ASSEMBLY Series name

Configuration of Part number



Note ① : Indicates that the type is either 3CV or 3C.

Note ② : If both ends are 3CV-CP: CP CP

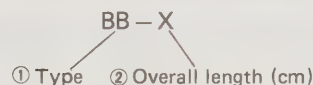
Note ③ : The numbers indicate the standard shell length (in units of cm).

Standard shell length: 0.5, 1, 2, 3, 4

Type Type BB-X

(1) CABLE ASSEMBLY Series name

Configuration of Part number



Note ① : If both ends have BNC plugs: BB

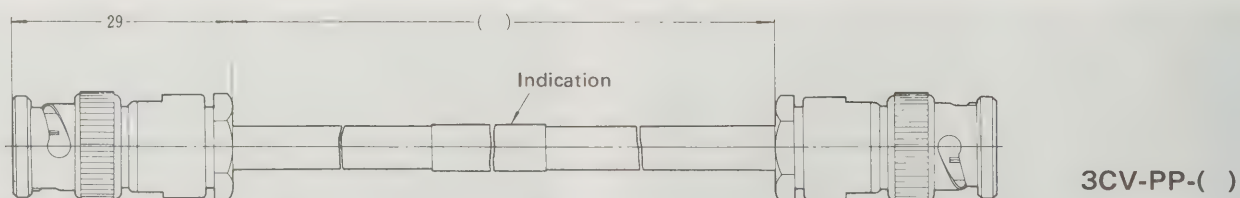
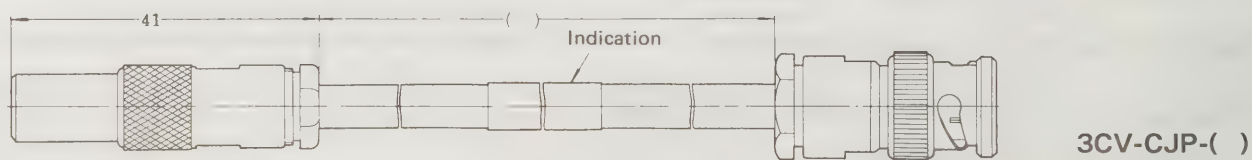
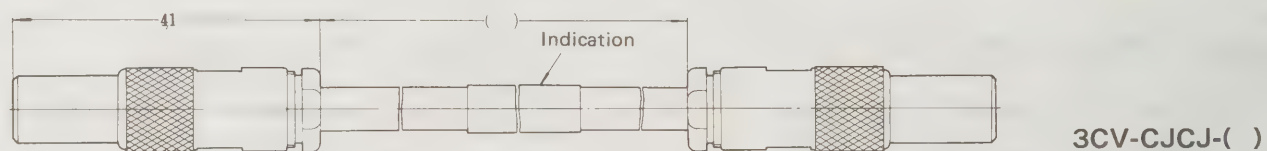
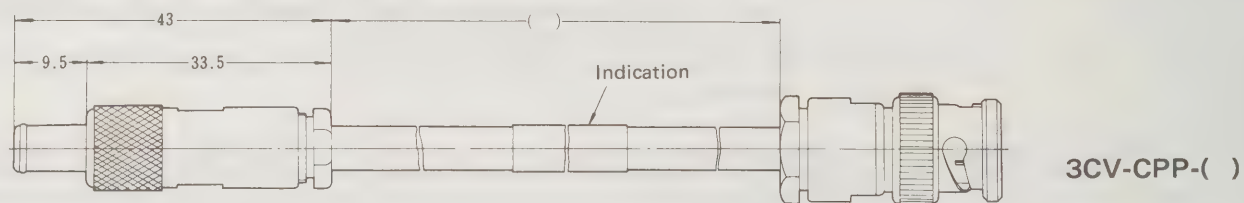
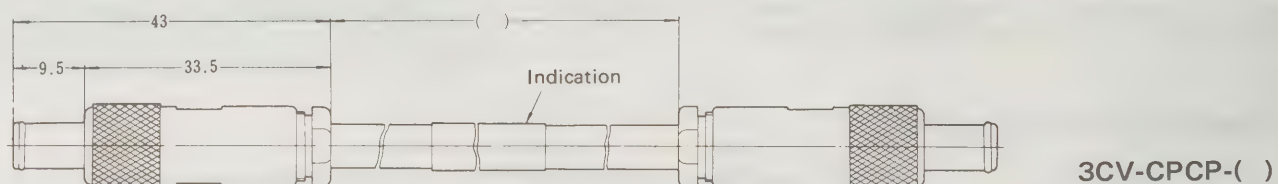
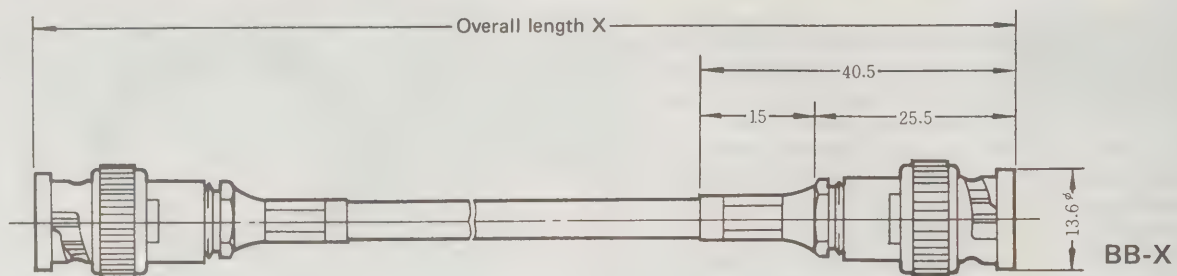
Note ② : The numbers indicate the overall length (in units of cm).

Performance characteristics

Characteristic impedance	75 Ω
Frequency characteristics	1.3 or less at 3000MHz
Withstand voltage	500V AC (rms value) for 1 minute
Contact resistance	5 mΩ or less (at 1A DC)
Insulation resistance	500MΩ or more at 500V DC
Cable clamping force	10kg or more

Performance characteristics

Characteristic impedance	50 Ω
Withstand voltage	1500V AC (rms value) for 1 minute
Contact resistance	5 mΩ or less (at 1mV)
Insulation resistance	500MΩ or more at 500V DC
Cable clamping force	10kg or more

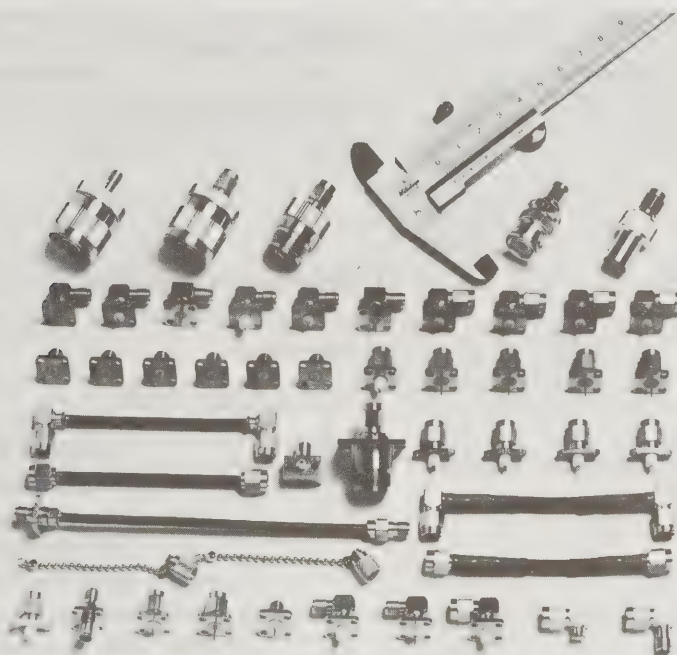


INFORMATION

The HRM (Hirose Radio Miniature) series are connectors of the SMA (Sub-Miniature Type A) type, prescribed in MIL-C-39012. We developed them in 1967, for the first time in Japan, thanks to our company's outstanding technology. Since then, their high reliability has been recognized, and we have a sales record of more than 6 million thus far.

Uses

The HRM series is suitable for in-unit wiring in wired and wireless communications equipment, broadcasting equipment, radar equipment and electronic measuring instruments, for connections between units, and for input/output terminals of equipment components. They display their effects especially in set designs subject to severe requirements, such as those which operate in a frequency band above the L band and which also have transmission.



Characteristic features

1. Outstanding performance characteristics.

The matters which most require consideration in matching the impedance of coaxial connectors are these: How are we to reduce the discontinuous capacitance caused by dimensional discontinuities on the transmission channel (the differences in level provided for supporting the center contacts or the dielectric materials), and how are we to correct the discontinuous capacitance which does occur? In this respect, the high-frequency performance characteristics of the HRM series are good because there are small differences in level in the transmission channel, and the discontinuous capacitance which does occur because of the differences in level is corrected by a unique technique.

Moreover, the series also has mechanically stable performance characteristics because the center contacts and dielectric materials have secure fastening structure.

2. They are compact in size, lightweight and sturdy.

The receptacle flanges are square in shape, measuring 12.7mm on each side. Their area being about one-half that of the BNC series and about one-fourth that of the S series, they are most suitable for high-density mounting. Moreover, their weights are greatly reduced (a standard receptacle weighs only about 3 grams). Even though they are compact and lightweight, their durability is no lower than that of other types, because they use stainless-steel shells.

3. They have high quality and reliability.

The HRM series is manufactured under a system of thorough quality control from the raw materials to the shipped product. In addition to the highest manufacturing quality, they also have high reliability, and not a single faulty unit has ever occurred at the end-user stage with a service record exceeding 6 million units.

4. There are many varieties.

An extensive expansion of the varieties has been carried out recently, including providing the S type for all varieties and adding airtight connectors and connectors for .085-inch semi-rigid cables. As a result, clients can now select products more freely than was possible before.

HRM SERIES RF CO-AXIAL CONNECTORS

Standard cables

The following are the standard cables of the HRM series:

Flexible cables — 3D-2W (Irrax cables)*
 — RG-142B/U

*These cables differ from the 3D-2W in the JIS standards and the NTT specifications. Please purchase from Sumitomo Electric Industries, Ltd. cables having the dimensions shown on p. 76.

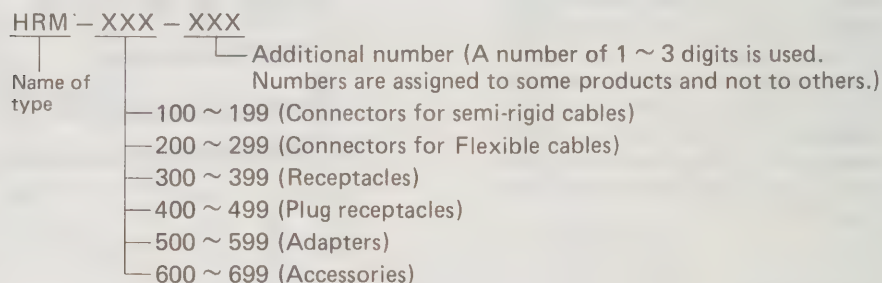
Semi-rigid cables — .141-inch semi-rigid cables (UT-141, UT-141A, UT-141AA etc.)
 — .085-inch semi-rigid cables (UT-85, UT-85C etc.)

The standard cable dimensions are listed on p. 76.

Types

1. Classification by function

Functionally, the cables are classified into six types. The following is the configuration of their names.



2. Classification by surface treatment

Products having the same structure, shape and dimensions may have different surface treatments of their armor (shell). There are gold-plated products (gold-plated type) and passivated products (S type).

Those of the S type have the letter S attached at the end of their part number.

Example 1 HRM-301 HRM-301S
 Gold-plated type S type

Example 2 HRM-400-12 HRM-400-12S
 Gold-plated type S type

Technical explanations of the S-type products and of passivation are given on p. 74.

3. Airtight type

Airtight products with hermetic seals are also available.

All airtight products are of the gold-plated type. Air tight types are not available in the S type. Products of the airtight type have the letter H attached at the end of their part number.

Example HRM-300-2H

HRM SERIES RF CO-AXIAL CONNECTORS

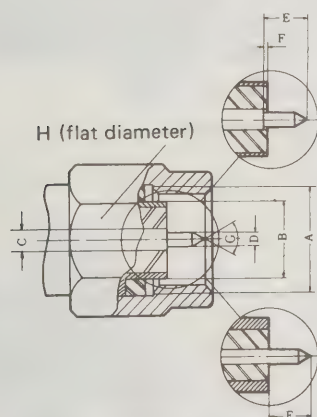
Main materials used

Parts	Materials		Finish			
	Materials	Applicable standards	Type		Plating	Plating thickness
Shell	Stainless steel	JIS G 4303	Gold-plated type		Gold plating	0.5 ~ 1 micron*
			S type	Straight type	Passivation	
				L-bent type	Nickel plating	3 microns
Coupling	Stainless steel	JIS G 4303	Gold-plated type		Gold plating	0.5 ~ 1 micron*
			S type		Passivation	
Female contact	Beryllium copper	JIS H 3270			Gold plating	2 ~ 3 micron
Male contact	Brass	JIS H 3250			Gold plating	2 ~ 3 microns
Solderless sleeve (ferrule)	Annealed copper	JIS H 3250			Nickel plating	3 microns
Insulation	Tetrafluoride resin					
Rubber packings	Silicone rubber					
Cord coverings	Fluoreresin					

*VA types with a plating thickness of 0.3 micron (min.) are also available.

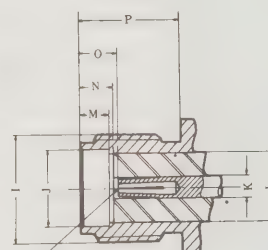
Dimensions of coupling parts

Male coupling parts



Symbols	Dimension values
A	¼-36UNS-2B
B	4.56φ ±0.02
C	1.27φ ±0.02
D	0.92φ ^{+0.01} / _{-0.015}
E	2.3
F	0 ^{+0.15} / ₋₀
G	60°
H	8

Female coupling parts



Insert pin of 0.910φ ^{+0.005}/₋₀
Grasping force 150 grams or more

Symbols	Dimension values
I	¼-36UNS-2A
J	4.62φ ±0.02
K	1.27φ ±0.02
L	4.11φ
M	1.93 ±0.02
N	1.93 ^{+0.05} / _{-0.1}
O	1.95 ^{+0.38} / ₋₀
P	5.8 or more

HRM SERIES RF CO-AXIAL CONNECTORS

Performance characteristics

Item		Performance characteristics
Structural dimensions	Structure	Refer to individual drawings.
	Dimensions	Refer to p.53 for the coupling part dimensions. Refer to p.55 ~ 73 for the external dimensions.
Electrical characteristics	Insulation resistance	500MΩ or more measured at 500V DC
	Withstand voltage	Test voltage 1000V AC (rms) (at normal pressure)
	Contact resistance	Each 4mΩ or less at center contact and at out contact
	Characteristic impedance	50Ω
	Frequency range	DC ~ 12.4GHz (Those with a range up to 18GHz are also available. They are marked in the catalog with (18 next to the name.)
	Voltage standing wave ratio (V.S.W.R.)	<div> <div>HRM-100 ~ 199</div> <div> <div>Products of the straight type which have no center contacts (Example HRM-101) 1.05 + 0.01f</div> <div>Products of the straight type which have center contacts (Example HRM-102) 1.05 + 0.015f (Note)</div> <div>L-bent type 1.10 + 0.02f (Note)</div> </div> </div> <p>Note: These values are limited to cases where .141-inch semi-rigid cables are used.</p> <div> <div>HRM-200 ~ 299</div> <div> <div>Straight type (Example HRM-202) 1.10 + 0.02f</div> <div>L-bent type (Example HRM-208) 1.10 + 0.025f</div> </div> </div> <div> <div>HRM-300 ~ 399</div> <div> <div>Straight type (Example HRM-301) 1.05 + 0.01f</div> <div>L-bent type (Example HRM-305) 1.05 + 0.025f</div> </div> </div> <div> <div>HRM-400 ~ 499</div> <div> <div>Straight type (Example HRM-401) 1.05 + 0.01f</div> <div>L-bent type (Example HRM-405) 1.05 + 0.025f</div> </div> </div> <div> <div>HRM-500 ~ 599</div> <div> <div>Straight type (Example HRM-513) 1.05 + 0.01f</div> <div>L-bent type (Example HRM-503) 1.05 + 0.025f</div> <div>Conversion adapter <div>For type N, type S (Example HRM-506) 1.05 + 0.01f</div> <div>For type BNC (Example HRM-517) 1.2 or less</div> </div> </div> </div> <div> <div>HRM-600 ~ 699</div> <div>Standard terminal device (HRM-601, 602) 1.05 + 0.015f</div> </div> <div> <div>Airtight products</div> <div>DC to 6GHz, .115 or less 6 ~ 12.4GHz, 1.2 or less</div> </div> <p>f = frequency in GHz</p>
Mechanical characteristics	Coupling tightening torque	6 ~ 10kg-cm
	Coupling fastening strength	50kg or more
	Center-contact holding power	150g or more
	Center-contact fastening torque	170g-cm or more
	Contact life	Contact resistance of 6 mΩ or less after 1000 insertions and withdrawals
Environmental characteristics	Vibration resistance	*There must be no abnormalities when tested by MIL-STD-202 Method 204, test condition D.
	Impact resistance	*There must be no abnormalities when tested by MIL-STD-202 Method 202 at an acceleration of 200G.
	Temperature-resistance cycles	*There must be no abnormalities when tested by MIL-STD-202 Method 202, test condition C.
	Corrosion resistance	*There must be no abnormalities when tested by MIL-STD-202 Method 101, test condition B.
	Humidity resistance	*There must be no abnormalities when tested by MIL-STD-202 Method 106, test condition C.
	Airtightness	1 x 10 ⁻⁷ cc/sec or less
	Radiation resistance	There must be no abnormalities when exposed to radiation of 3 x 10 ¹³ neutrons.

*The coupling tightening torque is 10kg-cm.

Guide to products

The following are typical products of the HRM series. Various products other than those listed here are also available. Please inquire about them.

Connectors for semi-rigid cables HRM-100~199

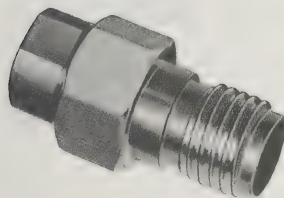
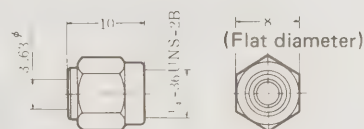
Connectors for semi-rigid cables match two types of cables: .141-inch and .085-inch semi-rigid cables. Use the .141-inch cables in order to obtain the V.S.W.R. listed on p. 54. The .085-inch cables, which have good flexibility, are suitable when high-density wiring is to be used inside the set. In this case, the V.S.W.R. value will be higher than with the .141-inch cables.



Part No.	
* HRM-101	(18)
* ★HRM-101S	(18)

Plugs for .141-inch semi-rigid cables

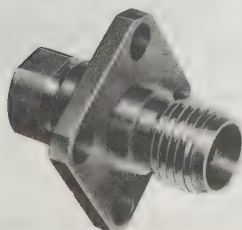
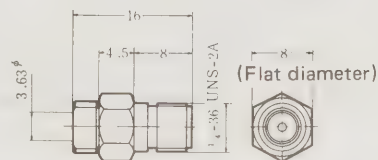
★The shells are gold-plated, and the couplings are passivated.



Part No.	
* HRM-102	
* ★HRM-102S	

Jacks for .141-inch semi-rigid cables

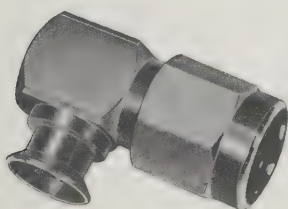
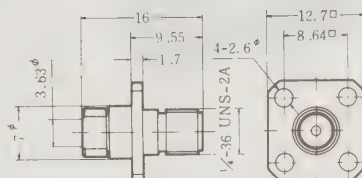
★The shells are passivated, and the tightening fixtures are gold-plated.



Part No.	
* HRM-103	
* ★HRM-103S	

Panel jacks for .141-inch semi-rigid cables

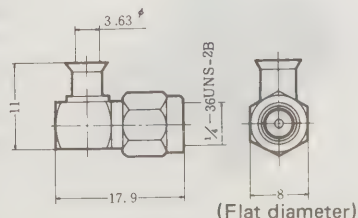
★The shells are passivated, and the tightening fixtures are gold-plated.



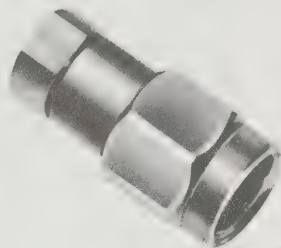
Part No.	
* HRM-104	
* ★HRM-104S	

L-type plugs for .141-inch semi-rigid cables

★The shells are gold-plated, and the couplings are passivated.



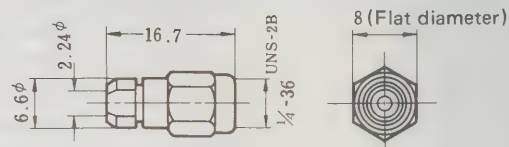
HRM SERIES RF CO-AXIAL CONNECTORS



Part No.
HRM-100-1
* HRM-100-1S

Plugs for .085-inch semi-rigid cables

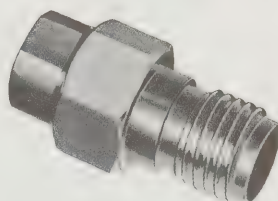
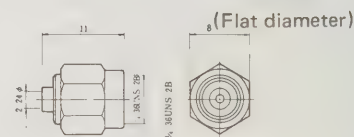
* The shells and couplings are passivated, and the tightening fixtures are gold-plated.



Part No.
HRM-100-1S1

Connectors for .085-inch semi-rigid cables

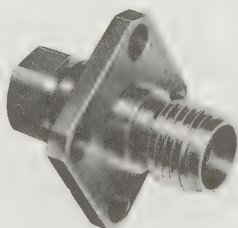
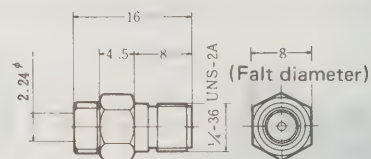
* The shell is gold-plated and the coupling is passivated.



Part No.
HRM-100-2
* HRM-100-2S

Jacks for .085-inch semi-rigid cables

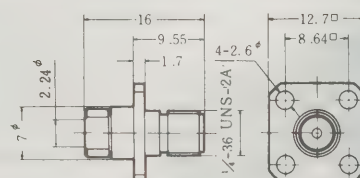
* The shells are passivated and tightening fixtures are gold-plated.

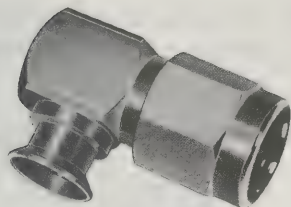


Part No.
HRM-100-3
* HRM-100-3S

Panel jacks for .085-inch semi-rigid cables

* The shells are passivated, and the tightening fixtures are gold-plated.

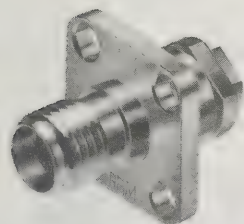
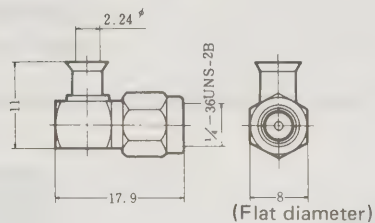




Part No.
HRM-100-4
★HRM-100-4S

L-type plugs for .085-inch semi-rigid cables

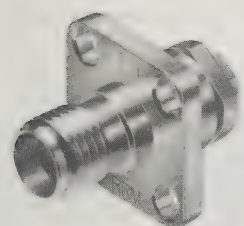
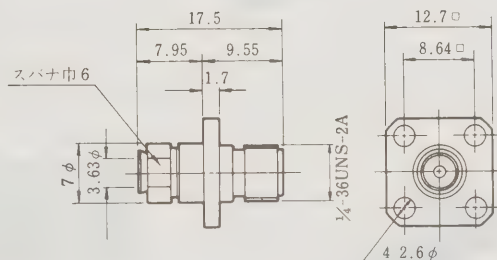
★ The shells are gold-plated, and the couplings are passivated.



Part No.
HRM-100-6S

Panel jacks for .141-inch semi-rigid cables

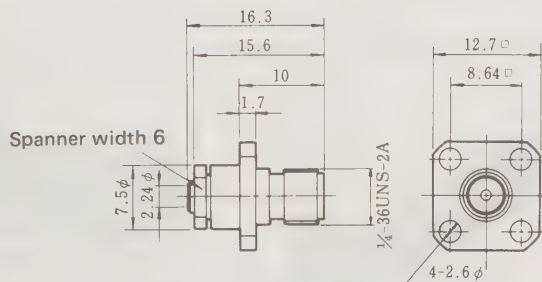
★ The shells and tightening fixtures are passivated, and the cord tubes are gold-plated.



Part No.
HRM-111

Panel jacks for .085-inch semi-rigid cables

★ The shells and tightening fixtures are passivated, and the cord tubes are gold-plated.



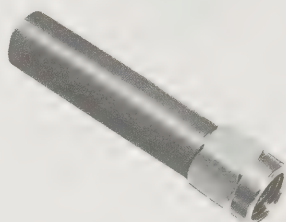
*Standard product

HRM SERIES RF CO-AXIAL CONNECTORS

Connectors for flexible cables HRM-200~299

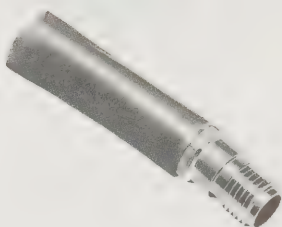
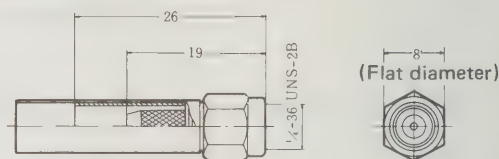
Two types of cables: RG-142B/U and 3D-2W (Irrax cables), match the connectors for flexible cables. However, the connectors are designed so that they will match both cables.

3D-2W (Irrax cables) differ from the 3D-2W cables in the JIS standards and the NTT specifications. Purchase cables with the dimensions on p. 78 from Sumitomo Electric Industries, Ltd.



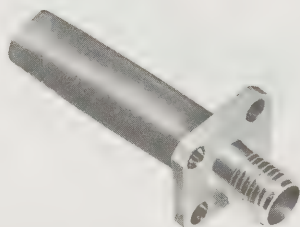
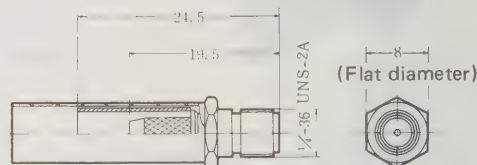
Part No.
* HRM-202
* HRM-202S

Plugs for RG-142B/U and 3D-2W (Irrax cables)



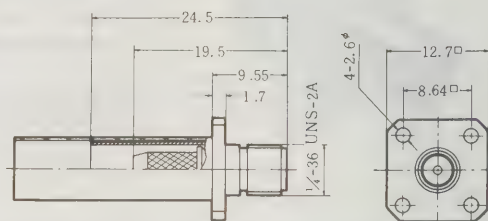
Part No.
HRM-204
HRM-204S

Jacks for RG-142B/U and 3D-2W (Irrax cables)



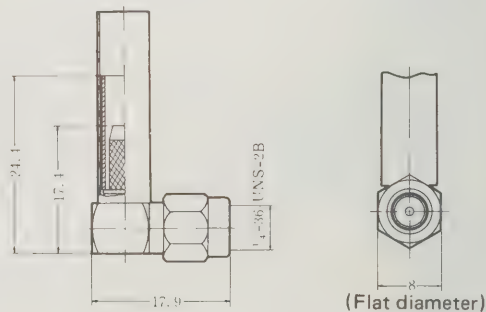
Part No.
HRM-206
HRM-206S

Panel jacks for RG-142B/U and 3D-2W (Irrax cables)



Part No.
* HRM-208
* HRM-208S

L-type Plugs for RG-142B/U and 3D-2W (Irrax cables)

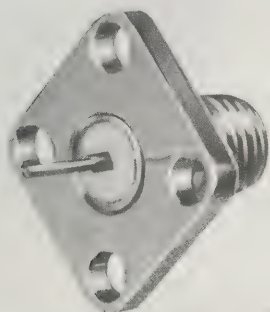


HRM SERIES RF CO-AXIAL CONNECTORS

Receptacles HRM-300~399

The mounting parts of the receptacles are available in types for mounting strip lines (microstrips, triplates, suspender types), for mounting waveguides, for mounting lead wires, etc.

There are two mounting systems: fastening with machine screws (M2.3) at four or two places.

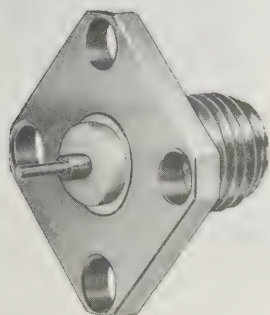
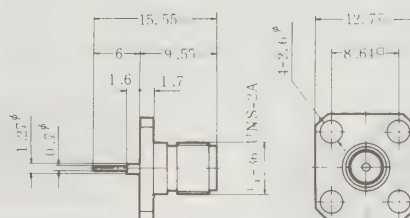


Part No.
* HRM-301
* HRM-301S

Fastened with machine screws at four places
Round-bar terminals
Straight receptacles

⑮

⑮

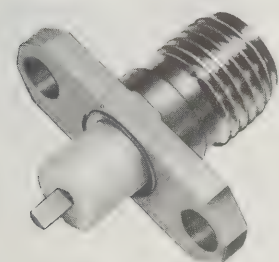
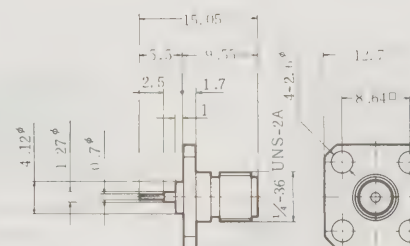


Part No.
* HRM-302
* HRM-302S

Fastened with machine screws at four places
Round-bar terminals
Straight receptacles

⑮

⑮

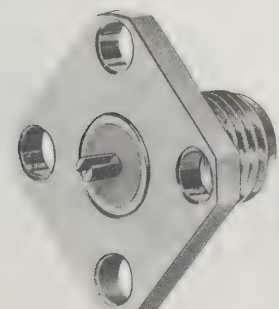
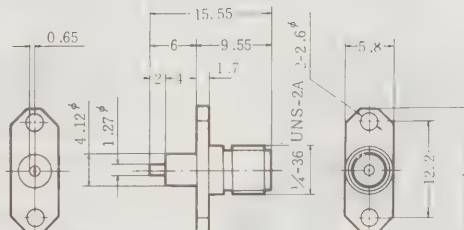


Part No.
* HRM-303
* HRM-303S

Fastened with machine screws at two places
Half-cut terminals
Straight receptacles

⑮

⑮

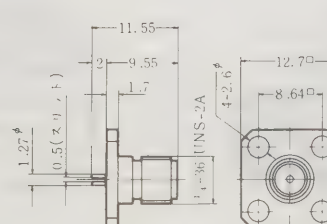


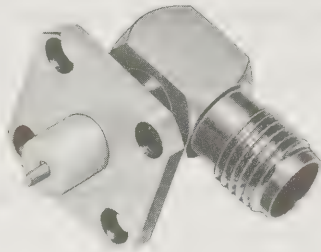
Part No.
* HRM-304
* HRM-304S

Fastened with machine screws at four places
Slitted terminals
Straight receptacles

⑮

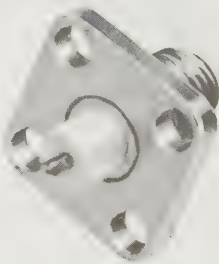
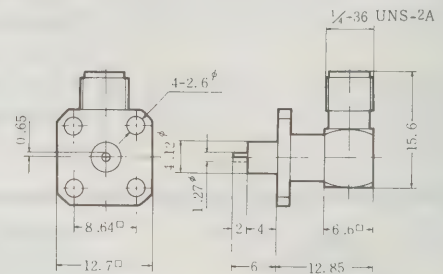
⑮





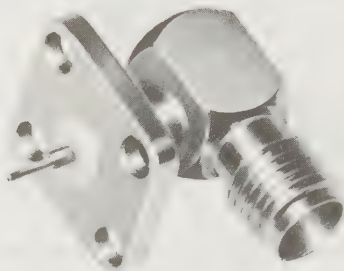
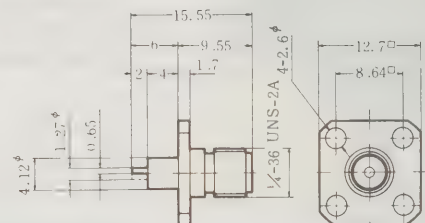
Part No.
HRM-305
HRM-305S

Fastened with machine screws at four places
Half-cut terminals
L-type receptacles



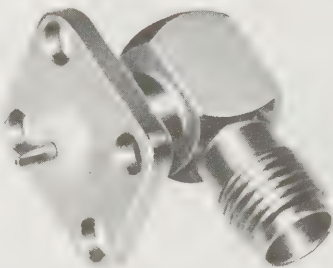
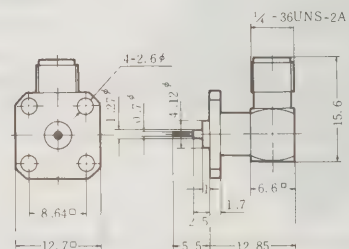
Part No.
HRM-306
HRM-306S

Fastened with machine screws at four places
Half-cut terminals
L-type receptacles



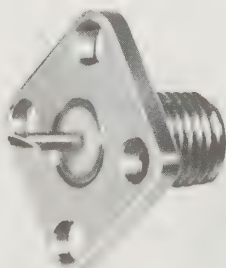
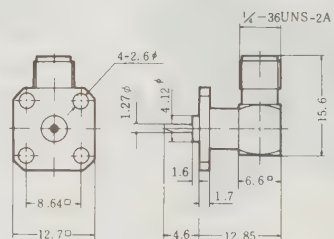
Part No.
HRM-307
HRM-307S

Fastened with machine screws at four places
Round-bar terminals
L-type receptacles



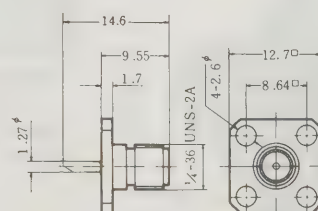
Part No.
HRM-300-58S

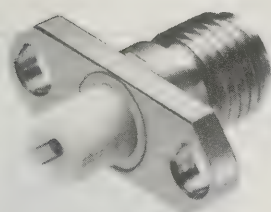
Fastened with machine screws at four places
Solder terminals
L-type receptacles



Part No.
HRM-300-60S

Fastened with machine screws at four places
Solder terminals
Straight receptacles



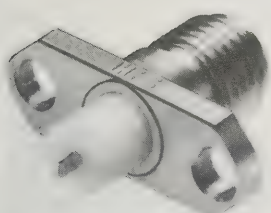
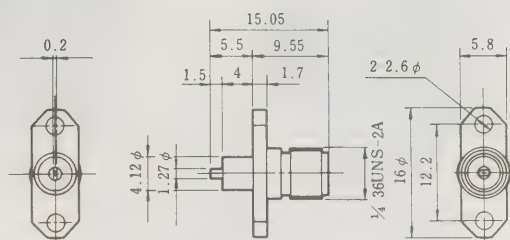


Part No.
HRM-300-11
HRM-300-11S

Fastened with machine screws at two places
Tab terminals
Straight receptacles

⑮

⑮

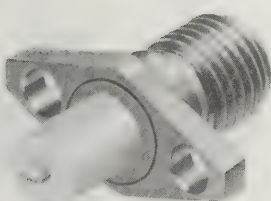
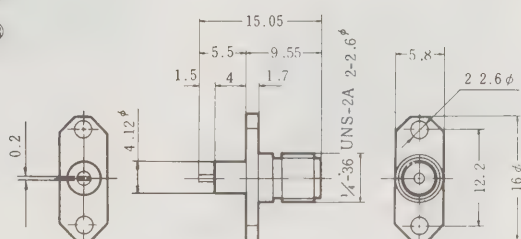


Part No.
HRM-300-25
HRM-300-25S

Fastened with machine screws at two places
Tab terminals
Straight receptacles

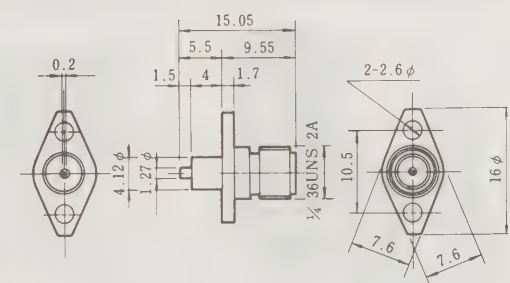
⑮

⑮



Part No.
HRM-300-100S

Fastened with machine screws at two places
Tab terminals
Straight receptacles

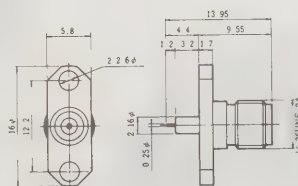


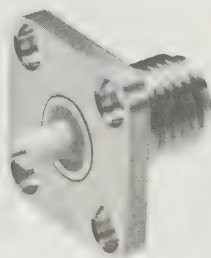
Note: Please note that the mounting pitch is different from that of regular products.



Part No.
HRM-300-110S

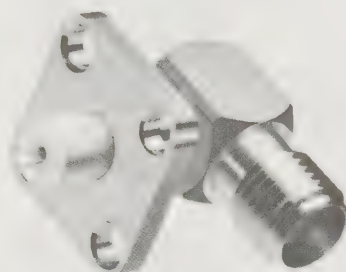
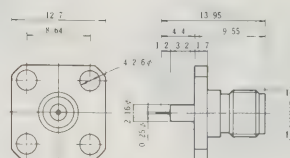
Fastened with machine screws at two places
Round-bar terminals
Straight receptacles





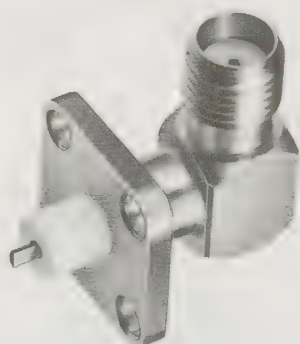
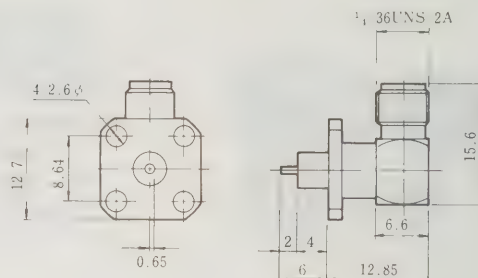
Part No.
HRM-300-118S

Fastened with machine screws at four places
Round-bar terminals
Straight receptacles



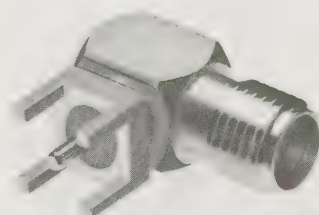
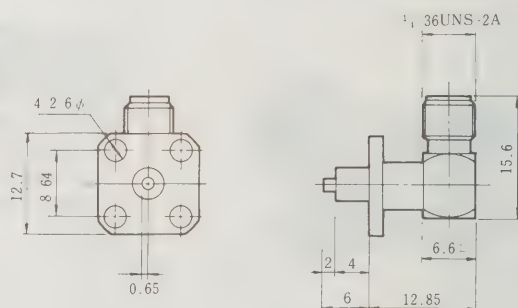
Part No.
HRM-309
HRM-309S

Fastened with machine screws at four places
Half-cut terminals
L-type receptacles



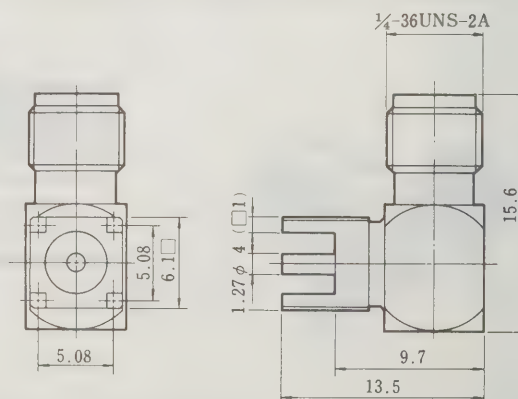
Part No.
HRM-310
HRM-310S

Fastened with machine screws at four places
Half-cut terminals
L-type receptacles



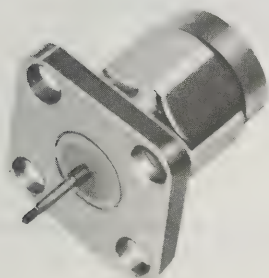
Part No.
HRM-300-126S

Type for mounting printed circuit boards
L-type receptacles



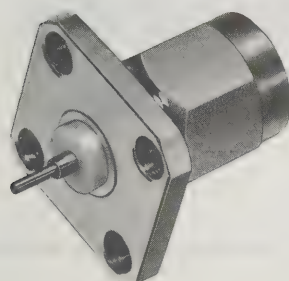
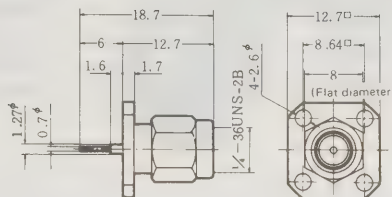
Plug receptacles HRM-400~499

The mounting parts of the plug receptacles are available in types for mounting strip lines (microstrips, triplates, suspender types), for mounting waveguides, etc. There are two mounting systems: fastening with machine screws (M2.3) at four or two places.



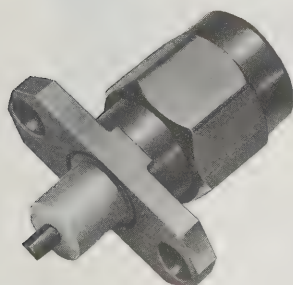
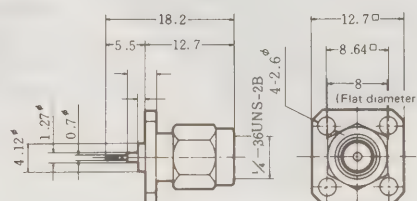
Part No.	
HRM-401	⑮
HRM-401S	⑮

* Fastened with machine screws at four places
Round-bar terminals
Straight plug receptacles



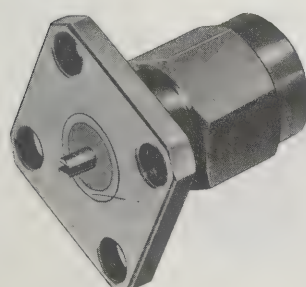
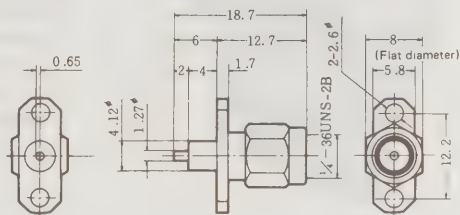
Part No.	
HRM-402	⑮
HRM-402S	⑮

* Fastened with machine screws at four places
Round-bar terminals
L-type plug receptacles



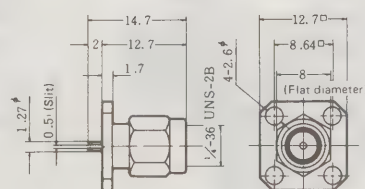
Part No.	
HRM-403	⑮
HRM-403S	⑮

* Fastened with machine screws at two places
Half-cutter terminals
Straight plug receptacles



Part No.	
HRM-404	⑮
HRM-404S	⑮

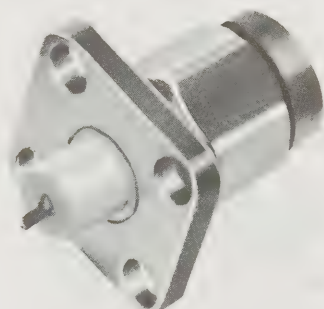
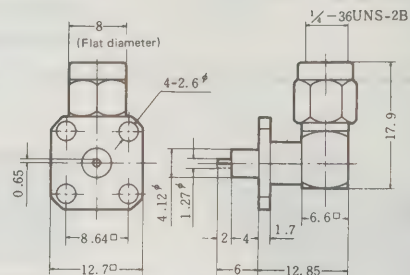
* Fastened with machine screws at four places
Slot terminals
Straight plug receptacles





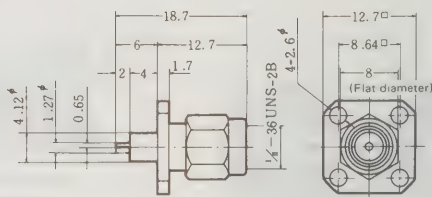
Part No.
HRM-405
HRM-405S

Fastened with machine screws at four places
Half-cutter terminals
L-type plug receptacles



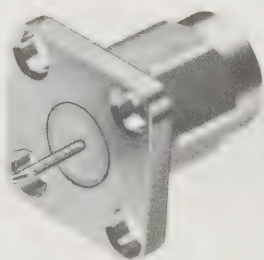
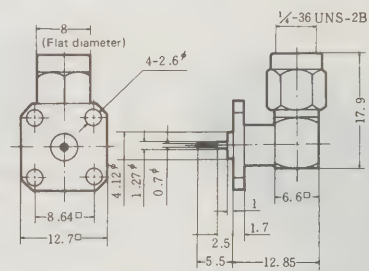
Part No.
HRM-406
HRM-406S

Fastened with machine screws at four places
Half-cutter terminals
Straight plug receptacles



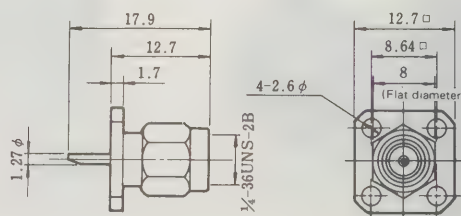
Part No.
HRM-407
HRM-407S

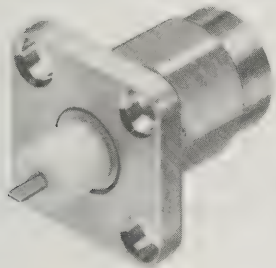
Fastened with machine screws at four places
Round-bar terminals
L-type plug receptacles



Part No.
HRM-400-36S1

Fastened with machine screws at four places
Solder terminals
Straight plug receptacles

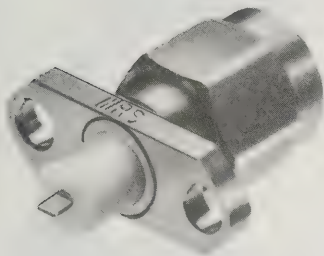
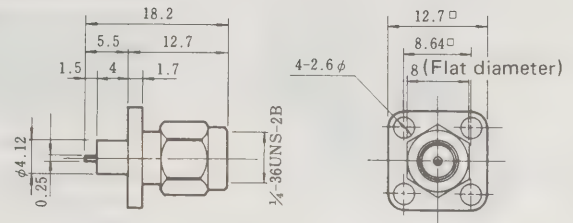




Part No.
HRM-400-41S

* Fastened with machine screws at four places
Tab terminals
Straight plug receptacles

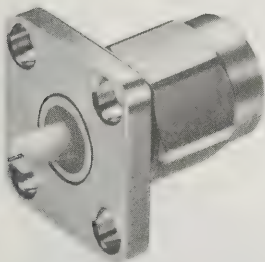
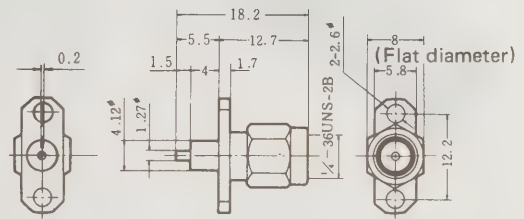
⑬



Part No.
HRM-400-12S

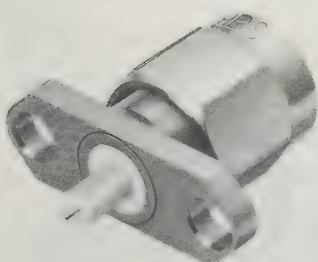
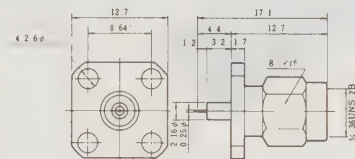
* Fastened with machine screws at two places
Tab terminals
Straight plug receptacles

⑬



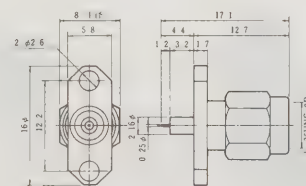
Part No.
HRM-400-42S

* Fastened with machine screws at four places
Round-bar terminals
Straight plug receptacles



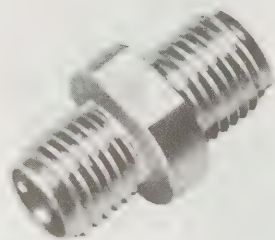
Part No.
HRM-400-43S

* Fastened with machine screws at two places
Round-bar terminals
Straight plug receptacles



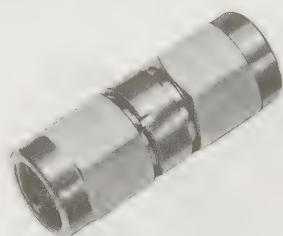
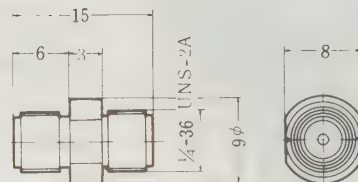
Adapters HRM-500~599

The following are the adapters connecting between the coupling parts of the HRM series:



Part No.
* HRM-501
HRM-501S

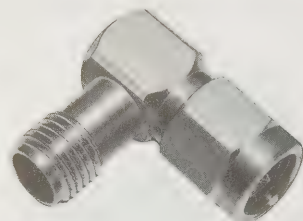
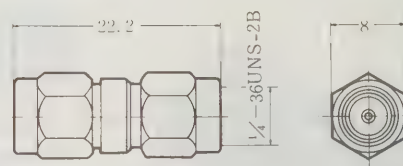
Female-female adapters
Shells are made of stainless steel and are of the integral type.



Part No.
* HRM-502
* HRM-502S
** HRM-502-1
** HRM-502-1S

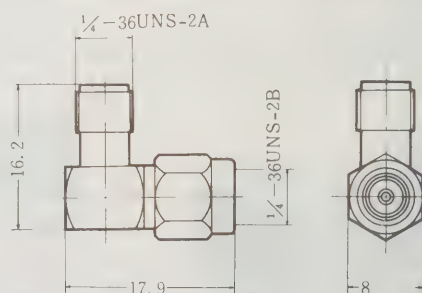
Male-male adapters

- * Shells are made of stainless steel and are split into two segments.
- ** Shells are made of stainless steel and are of the integral type.



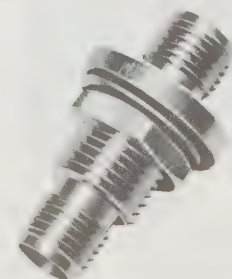
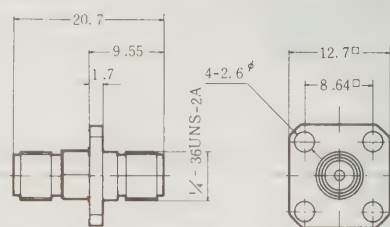
Part No.
* HRM-503
HRM-503S

Male-female L-type adapters



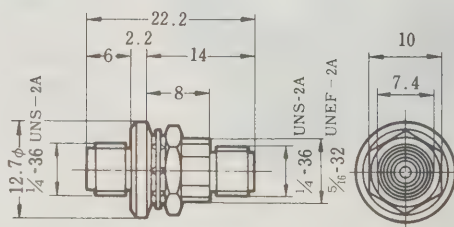
Part No.
* HRM-513
* HRM-513S

Female-female panel adapters
Shells are made of stainless steel and are of the integral type



Part No.
HRM-500-1S

Nut-fastened-type panel adapters

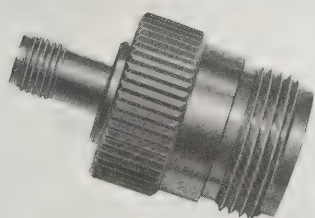


Conversion adapters HRM-500~599

The conversion adapters connecting between the HRM series and other series are of three systems: those for the S series, those for the BNC series, and those for the N series.

Those for the S series and those for the BNC series parts are of two types. In both of them, the S-series parts of BNC-series parts are made of brass. In one type, the HRM-series parts are made of stainless steel and are split into two segments; in the other, the HRM-series parts are made of stainless steel and are of the integral type.

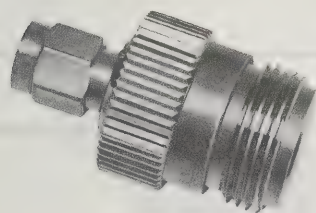
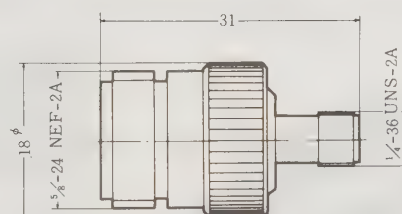
Those for the S series



Part No.
* ★ HRM-506
★ HRM-506S
★★ HRM-506-1S

S series female —
HRM series female

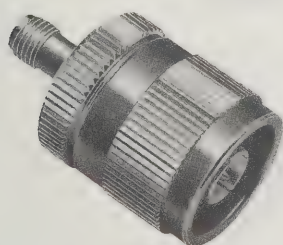
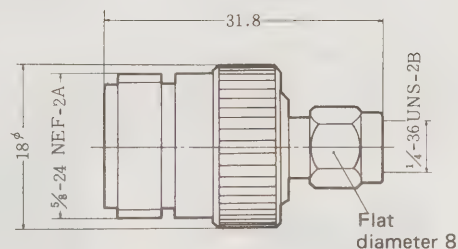
- ★ Split into two segments
- ★★ Integral type



Part No.
* ★ HRM-507
★ HRM-507S
★★ HRM-507-1S

S series female —
HRM series male

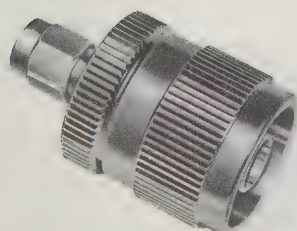
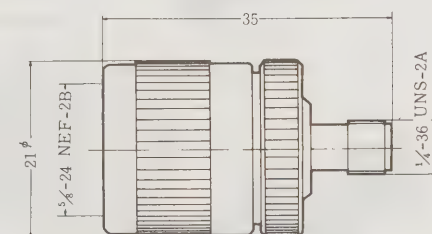
- ★ Split into two segments
- ★★ Integral type



Part No.
* ★ HRM-508
★ HRM-508S
★★ HRM-508-1S

S series male —
HRM series female

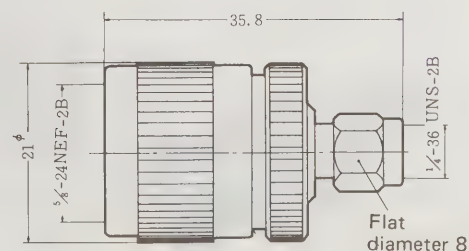
- ★ Split into two segments
- ★★ Integral type



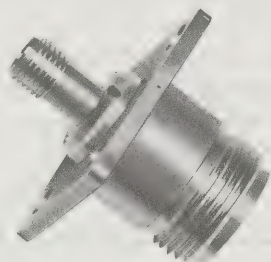
Part No.
* ★ HRM-509
★ HRM-509S
★★ HRM-509-1S

S series male —
HRM series male

- ★ Split into two segments
- ★★ Integral type



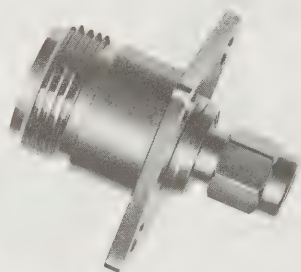
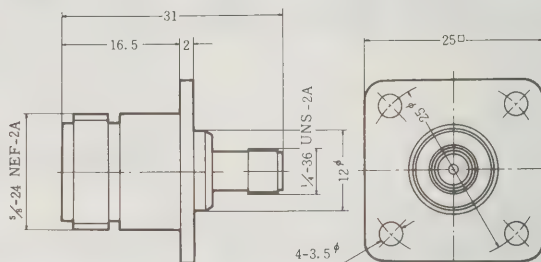
HRM SERIES RF CO-AXIAL CONNECTORS



Part No.
* HRM-511
* HRM-511S
** HRM-511-1S

S series female —
HRM series female
Panel adapter

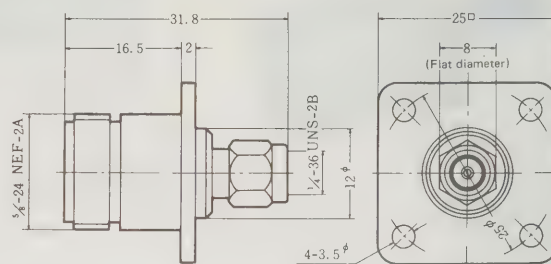
- * Split into two segments
- ** Integral type



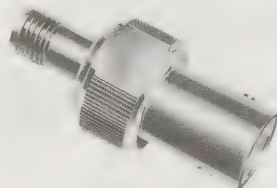
Part No.
* HRM-512
* HRM-512S
** HRM-512-1S

S series female —
HRM series male
Panel adapter

- * Split into two segments
- ** Integral type



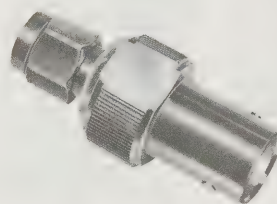
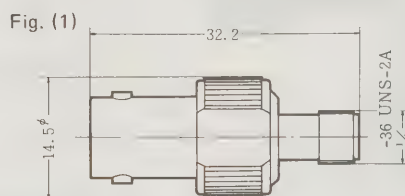
Those for the BNC series



Part No.
* HRM-516
* HRM-516S
** HRM-516-1S

BNC series female —
HRM series female

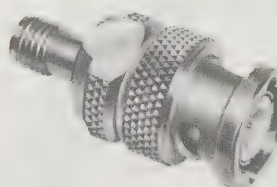
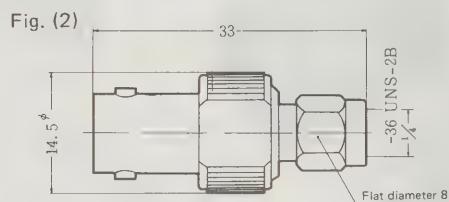
- * Split into two segments
- ** Integral type



Part No.
* HRM-517
* HRM-517S
** HRM-517-1S

BNC series female —
HRM series male

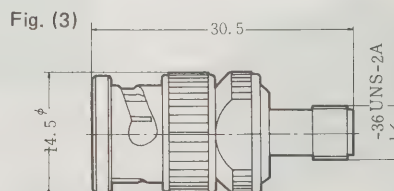
- * Split into two segments
- ** Integral type



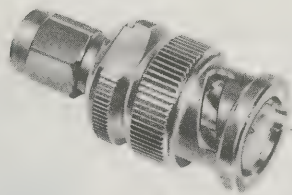
Part No.
* HRM-518
* HRM-518S
** HRM-518-1S

BNC series male —
HRM series female

- * Split into two segments
- ** Integral type



HRM SERIES RF CO-AXIAL CONNECTORS

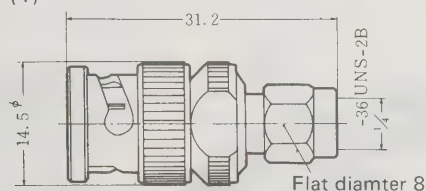


Part No.
* HRM-519
* HRM-519S
** HRM-519-1S

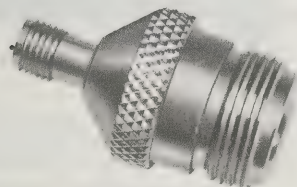
BNC series male —
HRM series female

- * Split into two segments
- ** Integral type

Fig. (4)

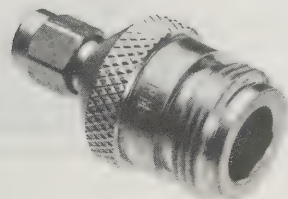
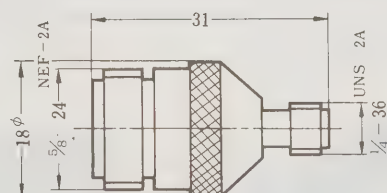


Those for the N series



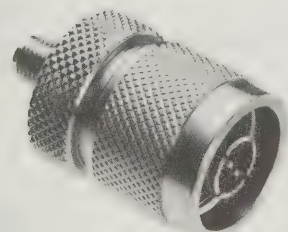
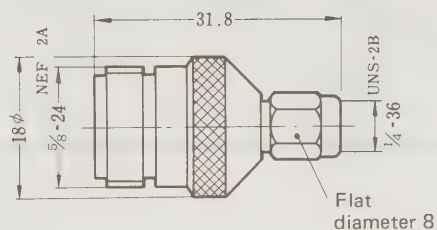
Part No.
HRM-552S

N series female —
HRM series female
Integral type



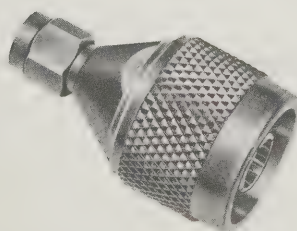
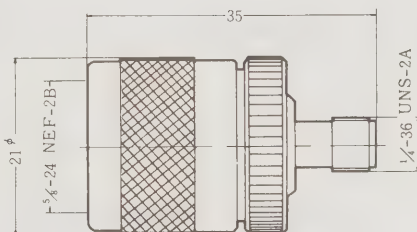
Part No.
HRM-553S

N series female —
HRM series male
Integral type



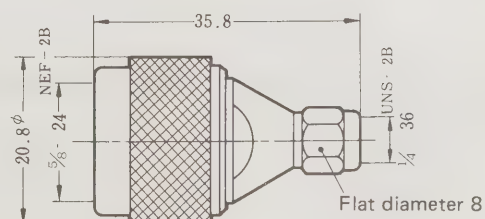
Part No.
HRM-554S

N series male —
HRM series female
Integral type

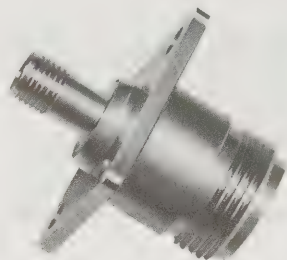


Part No.
HRM-555S

N series male —
HRM series male
Integral type

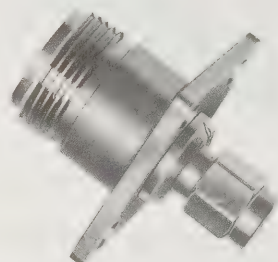
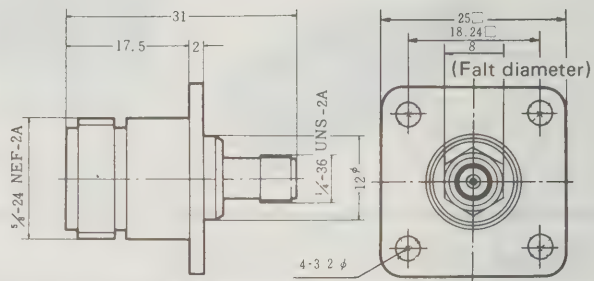


HRM SERIES RF CO-AXIAL CONNECTORS



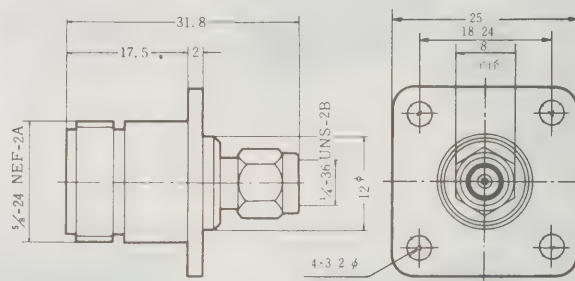
Part No.
HRM-556S

N series female —
HRM series female
Panel adapter
Integral type



Part No.
HRM-557S

N series female —
HRM series male
Panel adapter
Integral type

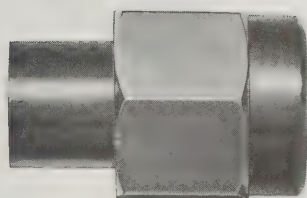


* Standard product

HRM SERIES RF CO-AXIAL CONNECTORS

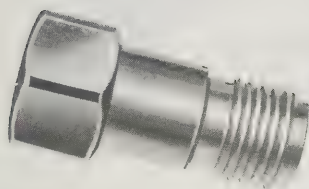
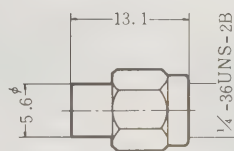
Accessories

Coaxial components such as dummy loads, attenuators, couplers and switches are listed in a separate catalog "Microwave components." Clients are invited to refer to it. Here we introduce two dummy-load products.



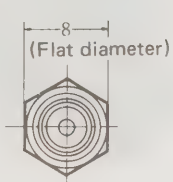
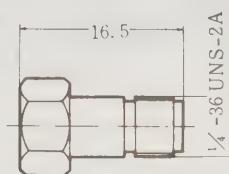
Part No.
HRM-601
HRM-601S

* Male coupling part dummy loads



Part No.
HRM-602
HRM-602S

Female coupling part dummy loads

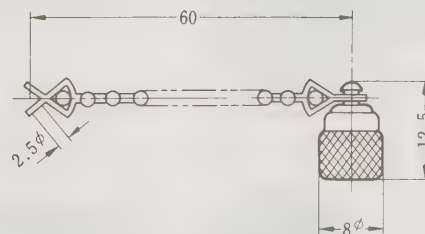


Caps



Part No.
HRM-514
HRM-514S

Dust caps



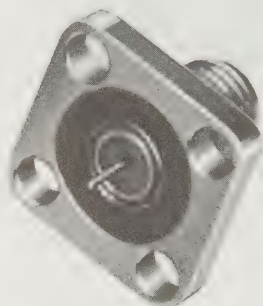
*Standard product

HRM SERIES RF CO-AXIAL CONNECTORS

Airtight type

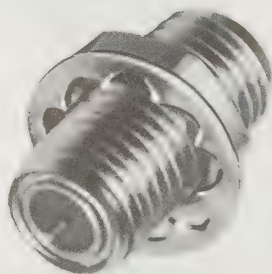
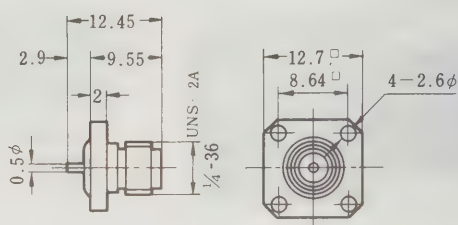
We offer the following airtight connector products, mainly receptacles and plug receptacles.

We can also design and fabricate of products to meet special specifications, including modifications of the structure and of the mounting specifications. Clients are invited to place orders for them.



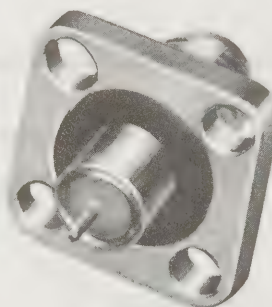
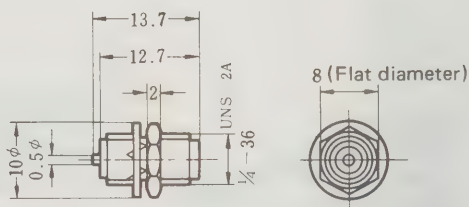
Part No.
HRM-300-1H

Fastened with machine screws at four places
Round-bar terminals
Straight receptacles



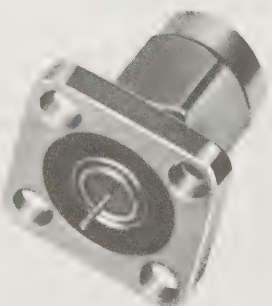
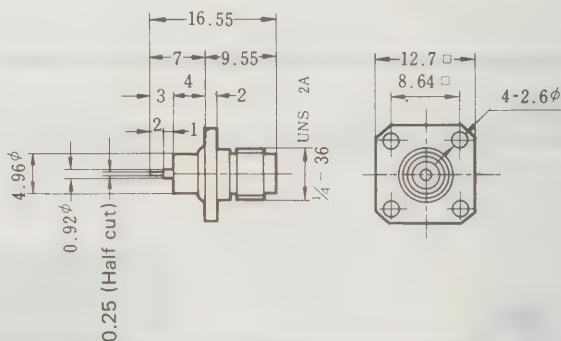
Part No.
HRM-300-2H

Nut fastening
Round-bar terminals
Straight receptacles



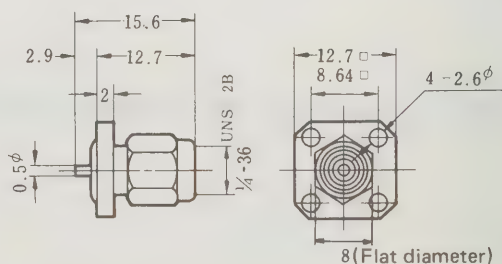
Part No.
HRM-300-3H

Fastened with machine screws at four places
Half-cut terminals
Straight receptacles



Part No.
HRM-400-1H

Fastened with machine screws at four places
Round-bar terminals
Straight plug receptacles

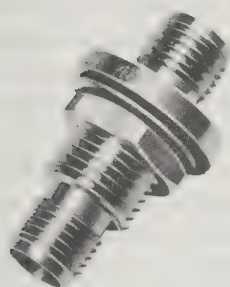
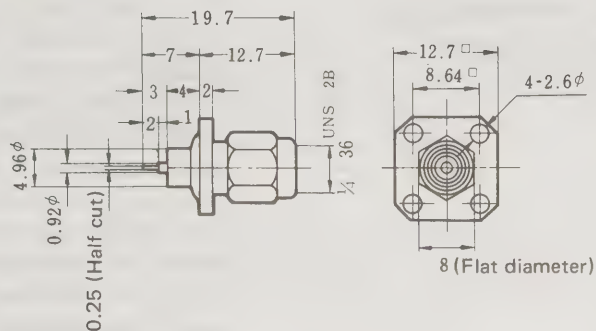


HRM SERIES RF CO-AXIAL CONNECTORS



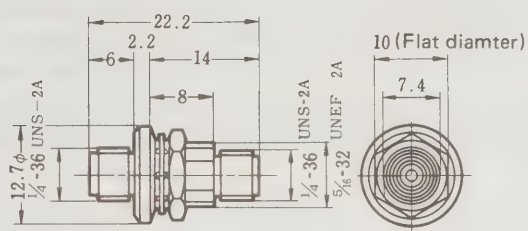
Part No.
HRM-400-2H

Fastened with machine
screws at four places
Half-cut terminals
Straight plug receptacles



Part No.
HRM-500-1H

Nut-fastened-type panel
adapters



Technical Guidance

Recommending the S type

The S type refers to products which use stainless steel as the shell material and in which the stainless steel has been passivated. Passivation refers to a type of surface treatment in which the outer surface of the stainless steel is etched with hydrofluoric acid in order to reduce the number of iron particles on it. This forms an oxide film which is thin enough to exert no influence on the electrical conductivity. The corrosion resistance of the stainless steel can be enhanced by performing this treatment. The original goal in developing the S type was to prevent corrosion. That is, in combinations in which the surface treatment of the armor parts is gold plating and the material of the set panel is aluminum, the potential difference between them is rather high (0.9V), and there is the danger that electrolytic corrosion may be induced under certain environmental conditions. As a countermeasure to prevent this, the S type is used, in which the potential difference between the stainless steel and aluminum is relatively low (0.4V).

Not only does the S type have high corrosion resistance, but it has also been proved to have corrosion resistance superior to that of the gold-plated type by acceleration tests with salt-water spraying and by tests in which samples were left for 5000 hours in places where there was much sulfurous acid gas. There are also other advantages. For example, in the gold-plated type, powder from the gold plating is deposited on the surfaces of the coupling parts, but this drawback is absent in the S type. In addition, since expensive gold is not used, the S type can be provided at a lower price than the gold-plated type.

In order to make more effective use of these advantages, it is scheduled in the future to give priority to the S type over the gold-plated type and to make it the standard product. Moreover, although passivation is, as a general rule, the surface treatment of the S type, other treatments may be used as special exceptions in the following cases:

- (1) In the L-bent type, nickel plating is used because the surface of stainless steel is highly discolored by the heat applied during brazing. In this case, the potential difference relative to the aluminum will be 0.6V.
- (2) In connectors for semi-rigid cables (HRM-100~199), gold plating is used in products in which the outer conductors of the cables are soldered (for example, the shell of HRM-101S) in consideration of the soldering properties.

High-Frequency Properties

1. Frequency Range

The cut-off frequency of the coaxial transmission path can be found from the following expression:

$$f_{\text{CUT}} = \frac{3 \times 10^{11}}{\pi (d_1 + d_2)/2} \text{ (Hz)}$$

d_1 = Outer diameter of center contact (unit: mm)
 d_2 = Inner diameter of outer contact (unit: mm)

The cut-off frequency of the HRM series calculated by this expression is 35.5GHz. However, this value is purely a theoretical value in an ideal transmission path. If we take into account the voltage standing wave ratio, the upper limit of the frequency that can be used industrially will be about 18GHz.

At the present time, the upper limit of the guaranteed frequency of the HRM series is 12.4GHz, lower than 18GHz. In certain products, satisfactory results have been obtained with frequencies of up to 18GHz as the typical value. Clients who plan to use frequencies higher than 12.4GHz are requested to inquire.

HRM SERIES RF CO-AXIAL CONNECTORS

2. Insertion Loss

The insertion loss of the HRM series can be found from the following expression:

$$\text{Loss} \leq 0.03 \sqrt{f \text{ (GHz)}} \text{ (dB)}$$

The insertion loss at 12.4GHz calculated by this expression is 0.1dB. That is, the insertion loss of the HRM series will be 0.1dB or less throughout the entire guaranteed band. This value has been confirmed.

3. High-Frequency Loss

The high-frequency loss of the HRM series has values of 100dB or more within the range of the guaranteed frequencies under the following two conditions: that the couplings are tightened with the prescribed torque, and that the sets and connectors are thoroughly fastened with machine screws.

4. Performance properties of the S Type

In the gold-plated type there will be little conductor loss because the electromagnetic field will be concentrated at the gold-plated parts because of the skin effect. However, in the S type the conductor loss will be larger because the electromagnetic field will be distributed in the stainless-steel parts. However, it will be nearly negligible since the transmission path is short (the length of the transmission path is 15.2mm when a typical receptacle and a plug receptacle are coupled together). The skin will be rough as a result of the passivation, but this has no influence at all on the performance characteristics because the roughness is far less than the finishing precision of the cutting.

1. Average Power

The permissible average power of the connectors cannot be determined unconditionally because a number of indeterminate conditions must be included, such as the frequency, the voltage standing wave ratio, the heat radiated by the device, the modulation ratio, etc. However, the value $50/\sqrt{f \text{ (GHz)}} \text{ (W)}$ can be applied as a tentative yardstick value for the HRM series. Even this value cannot be said to be an absolute yardstick on account of factors such as the heat radiation conditions. In actual practice, 50W has been applied at 6GHz.

2. Peak Power

The peak power of the connectors is determined by their breakdown voltage. In the HRM series, the peak power is about 20kW.

Note that the values of both the average power and the peak power are values applicable under the following conditions:

- (1) There is to be a state of normal temperature, normal humidity, and normal pressure.
- (2) In products to which cables are connected, priority is to be given to the permissible power values of the cables. Even in cases where the cables have a higher permissible power than the connectors, there are to be no defects in the wiring connections.
- (3) There is to be no metal powder on the coupling surfaces of the connectors. Care must be taken especially in the gold-plated type, since there is a tendency for metal powder to be deposited on the coupling surfaces of this type.

Permissible Electric Power

HRM SERIES RF CO-AXIAL CONNECTORS

Tightening Torque of Couplings

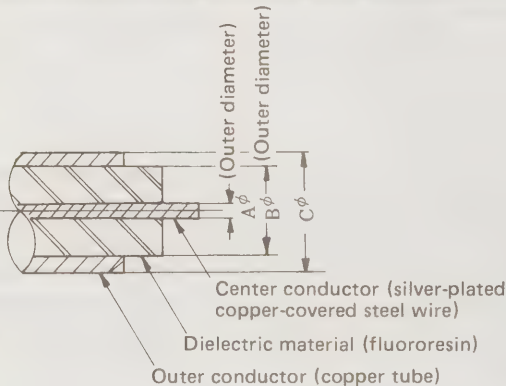
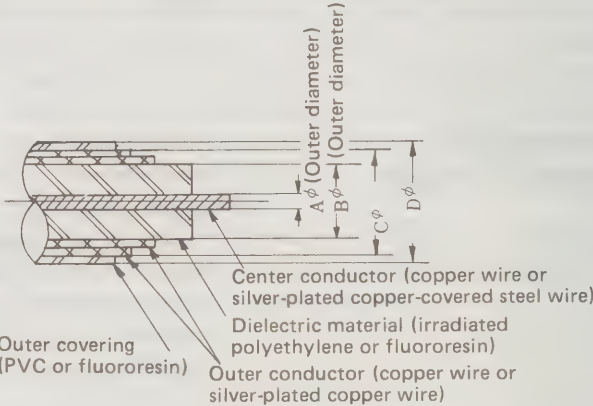
Suitable values for the tightening torque of couplings of the HRM series are 6 ~ 10kg-cm. As for which values ought to be chosen for use within this range, the most suitable tightening torque is 6kg-cm when no particular vibrations are applied except during transport, or 10kg-cm in environments where vibrations are applied.

The following is the basis on which the range of 6 ~ 10kg-cm was established. First, in vibration tests simulating the vibration conditions that occur during transport, it has been confirmed that loosening does not occur when the couplings are tightened with a torque of 3kg-cm. Thus, allowing a safety factor of 2 times, the value was set at 6kg-cm. The upper limit value of 10kg-cm was established on the basis of the amount of dimensional changes in the outer diameter of the male coupling part, which is $4.56\phi \pm 0.02$.

Thus, the tightening torque of the couplings of the HRM series has a narrow range, and problems will occur if they are tightened with a torque outside of this range. Consequently, we recommend that you use an 8mm x 6kg-cm or 8mm x 10kg-cm torque wrench when tightening the couplings.

Standard Cables

The standard cables of the HRM series have the following dimensions, structures and materials:

Semi-rigid cables				Flexible cables				
								
Unit: mm				Unit: mm				
Type of cable	Aφ	Bφ	Cφ	Type of cable	Aφ	Bφ	Cφ	Dφ
.141-inch semi-rigid cable	0.912φ	2.946φ ± 0.025 ~3.01φ ± 0.025	3.581φ ± 0.025	*3D-2W (Irrax cable)	0.90φ ± 0.02	3.0φ ± 0.2	4.4φ	5.6φ ± 0.3
.085-inch semi-rigid cable	0.511φ	1.671φ ± 0.025	2.197φ ± 0.025	RG-142B/U	0.991φ	2.95φ ± 0.12	4.34φ	4.95φ ± 0.12

*Not the same as the 3D-2W in the JIS standards and NTT specifications.

HRM SERIES RF CO-AXIAL CONNECTORS

Tools for connecting wiring

Below are a table giving an overview of the tools used for connecting the wiring of the HRM series and a table listing the tools used for typical products:

Part No.	Overview of tool	Special remarks
HRM-T-1	Positioning tool for center contacts of female coupling parts	
HRM-T-2	Positioning tool for center contacts of male coupling parts	
HRM-T-3	Tapering tool for tips of center conductors of .141-inch semi-rigid cables	*Unsuitable for use as a mass-production tool.
HRM-T-4	Tool for crimp bonding of ferrules (sleeves) of connectors for flexible cables	
HRM-T-5	Tool for bending .141-inch semi-rigid cables	
HRM-T-6	Soldered positioning and cutting tool for .141-inch semi-rigid cables	*Unsuitable for use as a mass-production tool.
HRM-T-7	Tool for mounting HRM-101 and 101S couplings on shells	
HRM-T-8	Soldered positioning and cutting tool for .085-inch semi-rigid cables	*Unsuitable for use as a mass-production tool.
HRM-T-9	Tool for bending .085-inch semi-rigid cables	

Part No.	Type of cable used	Recommended tools
HRM-101, 101S	.141-inch semi-rigid cables	HRM-T-3,5,6,7
HRM-102, 102S	.141-inch semi-rigid cables	HRM-T-1, 5, 6
HRM-103, 103S	.141-inch semi-rigid cables	HRM-T-1, 5, 6
HRM-104, 104S	.141-inch semi-rigid cables	HRM-T-2, 5
HRM-100, 100-4S	.085-inch semi-rigid cables	
HRM-202, 202S	3D-2W (Irrax cable) RG-142B/U	HRM-T-2, 4
HRM-204, 204S	3D-2W (Irrax cable) RG-142B/U	HRM-T-1, 4, 6
HRM-206, 206S	3D-2W (Irrax cable) RG-142B/U	HRM-T-1, 4, 6
HRM-208, 208S	3D-2W (Irrax cable) RG-142B/U	HRM-T-2, 4
HRM-100-1, 100-1S	.085-inch semi-rigid cables	HRM-T-2, 8, 9
HRM-100-2, 100-2S	.085-inch semi-rigid cables	HRM-T-1, 8, 9
HRM-100-3, 100-3S	.085-inch semi-rigid cables	HRM-T-1, 8, 9

HRM-T-1

Locator for jacks



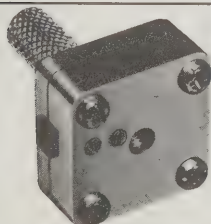
HRM-T-2

Locator for plugs



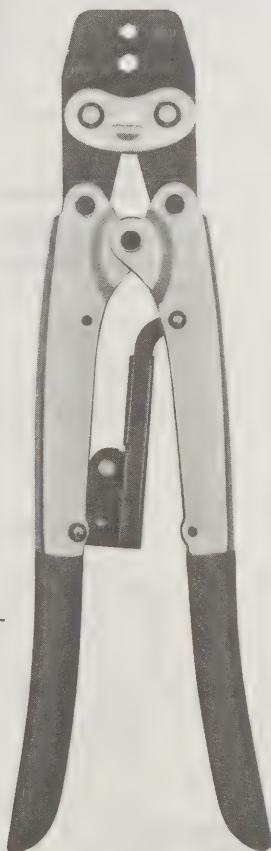
HRM-T-3

Tool for fabricating tips of .141-inch cables (for laboratory use)



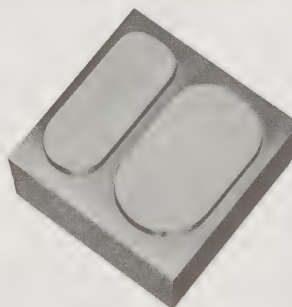
HRM-T-4

Crimp tool



HRM-T-5, T-9

Tool for bending cables



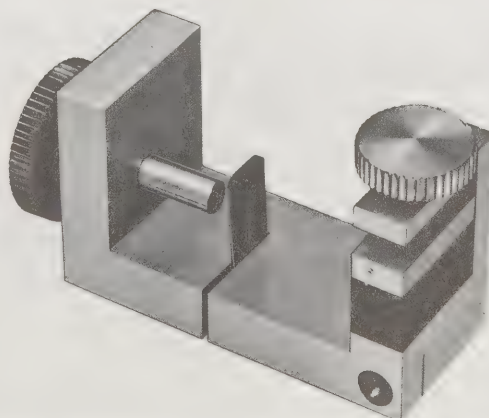
HRM-T-7

Coupling inserting tool



HRM-T-6, T-8

Soldering tool



Connecting Methods

1. HRM-101, 101S

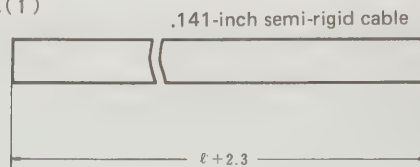
(1) Cut cable (refer to Fig. (1))

When cutting semi-rigid cables, cut them at the actually needed length ℓ plus 2.3mm.

Note 1: Take care that the cut surface is vertical.

Note 2: Length ℓ should be the length of the outer conductor of the cable after the wiring has been completely connected.

Fig. (1)



(2) Fasten the cable to the shell by soldering. (Use HRM-T-6)

i) Fasten ① in Fig. (2) with a vice.

ii) As shown in the figure, pass the P shell through the cable, and fasten the cable by tightening ③.

iii) Next, tighten ② so that the cable tip protrudes 2.3mm from the tip of the shell.

iv) Fasten the shell by soldering it to the cable.

Note 1: It is desirable to use at this time a soldering iron of about 80W.

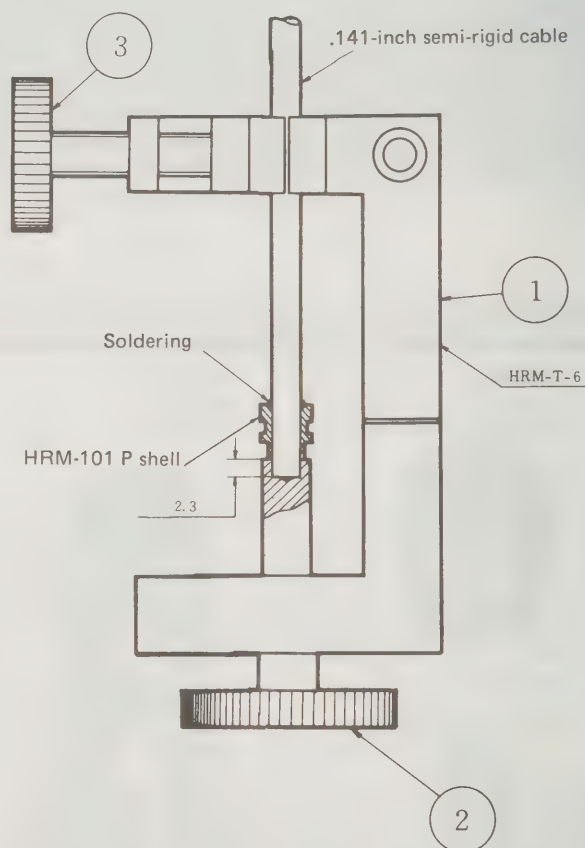
Note 2: The solder must be applied evenly on the circumference.

Note 3: During soldering, be careful not to allow the tip of the shell to move away from ②.

Note 4: Screw ③ must be tightened tightly so that the cable will not move as a result of the thermal stress generated by the soldering.

Note 5: Polish the soldered part of the cable in advance with sandpaper or the like so that the solder will adhere easily to it.

Fig. (2)

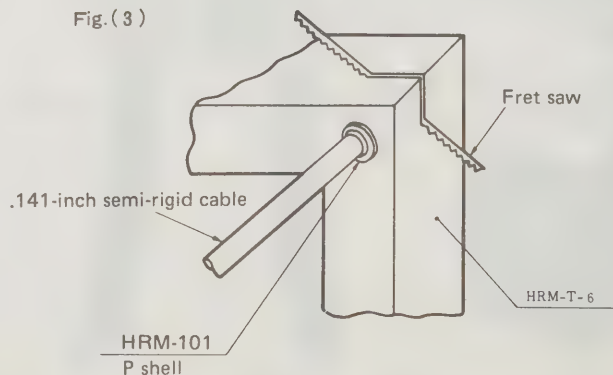


(3) Cut off the outer conductor of the cable with a fret saw at the shell-tip position. (Refer to Fig. (3).)

Note 1: Be careful not to damage the shell tip when cutting the cable, and be sure that the shell tip and the cut surface of the cable will be on the same surface.

Note 2: The slit with a width of 0.4 on the tool is provided so that the fret saw will stop between the center conductor and outer conductor of the cable. Care is necessary because if the tool is damaged during cutting the depth of the slit will change, and consequently the center conductor of the cable will be damaged.

Fig. (3)

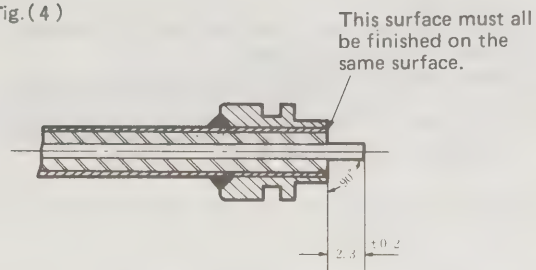


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- (4) Cut the cable insulation vertically at the shell tip (using a razor) and remove it. (Refer to Fig. (4).)

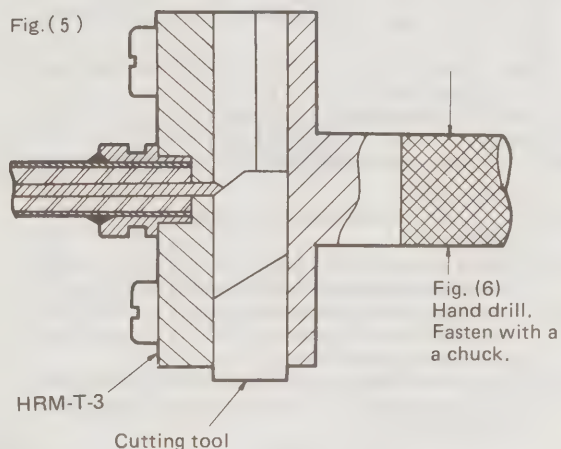
Note 1: Be careful that the center conductor of the cable is not bent or damaged. Check to make sure that the part of the center conductor protruding from the shell tip is $2.3\text{mm} \pm 0.2$.

Fig.(4)



- (5) Cut the tip of the center conductor to a 60° angle.
 i) Tighten and fasten HRM-T-3 on the hand drill by means of the chuck, as shown in Fig. (5).
 ii) Insert the block in Fig. (4) into the handhole at the center of HRM-T-3, and turn HRM-T-3 with the hand drill. (This tool is used on an experimental level. In mass production, work with a lathe or the like.)

Fig.(5)



- (6) Insert the coupling
 i) Incorporate the rubber packing and the spring washer as shown in Fig. (6).
 ii) Shorten the spring washer with HRM-T-7 as shown in Fig. (7) until it matches the outer diameter of the shell, and insert the coupling from the direction indicated by the arrow.

Note 1: Check to make sure that the spring washer drops accurately into the groove in the coupling as shown in Fig. (8). (If it is inserted correctly, the dimensions of the coupling tip and of the shell tip ought to be 2.7, as shown in Fig. (8).)

Fig.(6)

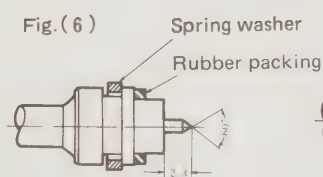


Fig.(7)

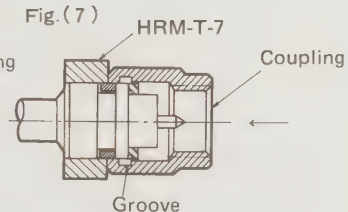
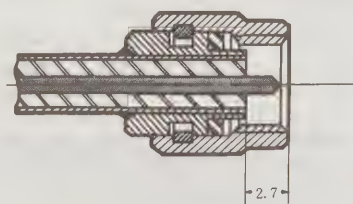


Fig.(8)

View of wiring connection when completed



2. HRM-102, 102S, 103, 103S

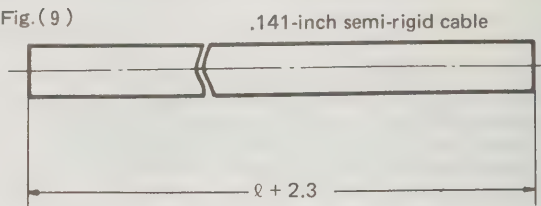
(1) Cut the cable.

When cutting semi-rigid cables, cut them at the actually needed length ℓ plus 2.3mm.

Note 1: Take care that the cut surface is vertical.

Note 2: Length ℓ should be the entire length of the outer conductor of the cable after the wiring has been completely connected.

Fig.(9)



(2) Fasten the cable to the shell by soldering.
(Use HRM-T-6)

- i) Fasten ① in Fig. (10) with a vice.
- ii) As shown in the figure, pass the tightening fixture through the cable, and fasten the cable by tightening ③.
- iii) Next, tighten ② so that the cable tip protrudes 2.3mm from the tip of the shell.
- iv) Fasten the tightening fixture by soldering it to the cable.

Note 1: It is desirable to use at this time a soldering iron of about 80W.

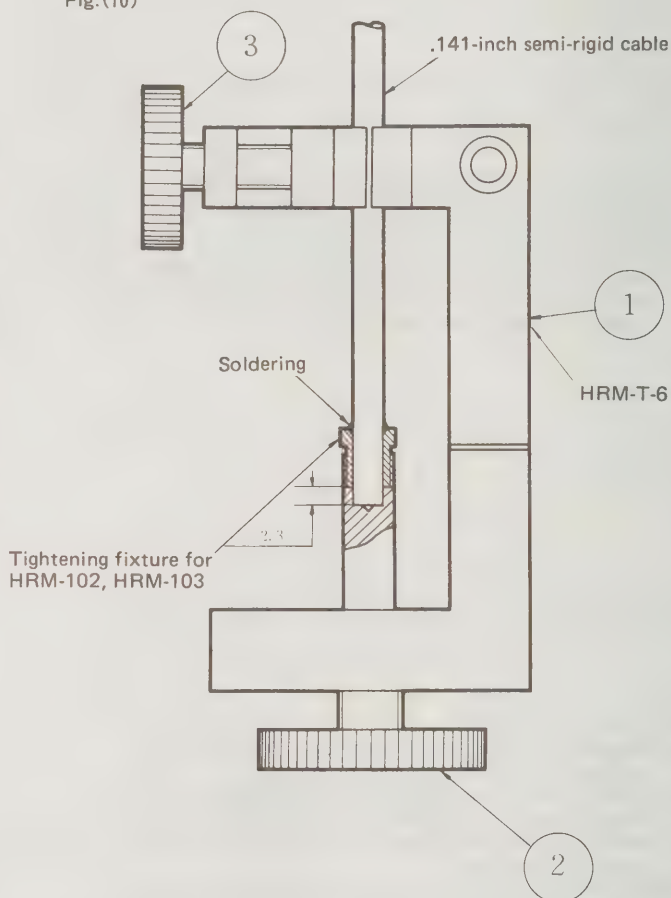
Note 2: The solder must be applied evenly on the circumference.

Note 3: During soldering, be careful not to allow the tip of the tightening fixture to move away from ②.

Note 4: Screw ③ must be tightened tightly so that the cable will not move as a result of the thermal stress generated by the soldering.

Note 5: Polish the soldered part of the cable in advance with sandpaper or the like so that the solder will adhere easily to it.

Fig.(10)

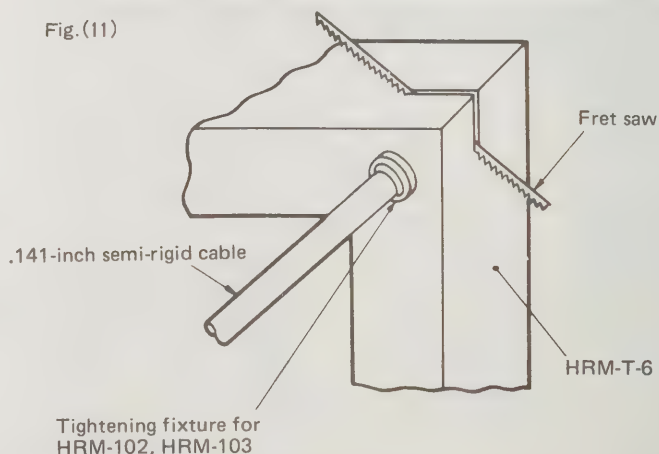


(3) Cut off the outer conductor of the cable with a fret saw at the tip position of the tightening fixture.
(Refer to Fig. (11).)

Note 1: Be careful not to damage the tip of the tightening fixture when cutting the cable, and be sure that the tip of the tightening fixture and the cut surface of the cable will be on the same surface.

Note 2: The slit with a width of 0.4 on the tool is provided so that the fret saw will stop between the center conductor and outer conductor of the cable. Care is necessary because if the tool is damaged during cutting the depth of the slit will change, and consequently the center conductor of the cable will be damaged.

Fig.(11)



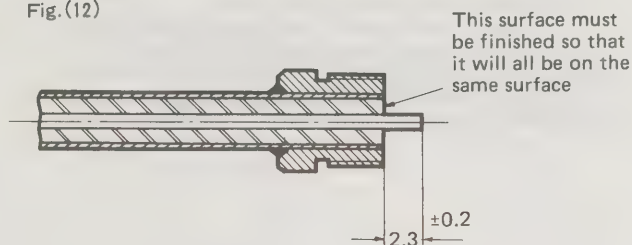
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- (4) Cut the cable insulation vertically at the tip of the tightening fixture (using a razor) and remove it. (Refer to Fig. (12).)

Note 1: The tip must be finished so that it will all be on the same surface.

Note 2: Be careful not to bend or damage the center conductor of the cable.

Fig.(12)



- (5) Solder the female end onto the center conductor of the cable. (Refer to Figs. (13) and (14).)

- i) Put the positioning plate of the center conductor ① into the groove of the HRM-T-6 proper.
- ii) Mount the block in Fig. (12) onto HRM-T-6, as shown in Fig. (13). The tip will strike against ①. Pass the center conductor of the cable through the groove of ①, and fasten at that position.
- iii) Fit the female contact for HRM-102, HRM-103 into the contact holder ③. Perform preliminary soldering and insert as shown in Fig. (13) from the horizontal hole in the HRM-T-6 proper ④. Align the center conductor of the cable with the female contact hole while heating the female contact with the soldering iron, and press it until it strikes against ①.
- iv) After the soldering is finished, remove ① and remove the block from the HRM-T-6 proper ④ and the contact holder ③. Finish the place which was soldered with a razor or the like uniformly on the circumference. (Refer to Fig. (14).)

Note 1: It is desirable to use at this time a soldering iron of about 20 ~ 30W.

Note 2: Be careful that extra solder does not flow onto the center conductor of the cable at the part $0.4^{+0}_{-0.04}$ in Fig. (14).

Note 3: Check the dimensions of Fig. (14) after soldering the female contact.

Fig.(13)

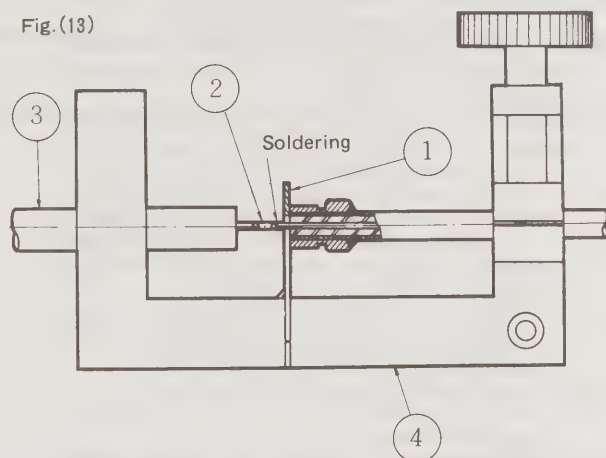
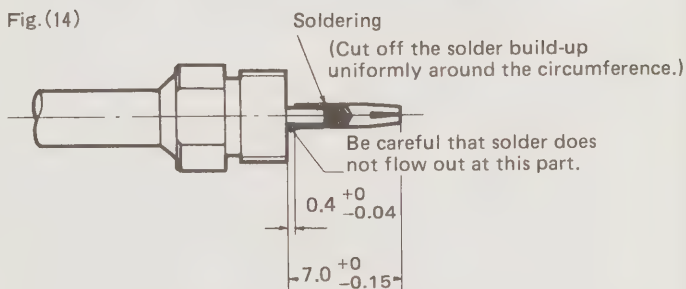


Fig.(14)

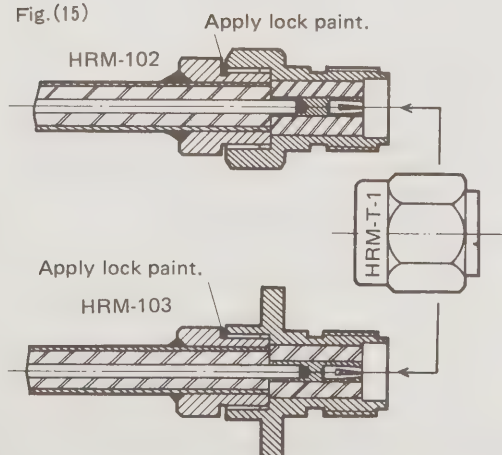


- (6) Screw the block into the connector proper. Connection of the wiring will be completed as in Fig. (15) when the block in Fig. (14) is screwed into the connector proper.

Note 1: The opening part must be fastened by means of HRM-T-1 (locator) so that the connector insulation will not move when the block is being screwed in.

Note 2: The screw must be tightened with a torque of 30kg-cm or more. When it is especially necessary to prevent the screw from loosening, lock paint is to be applied as is shown in the figure.

Fig.(15)



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3. HRM-104, 104S

(1) Process cable ends. (Refer to Fig. (16).)

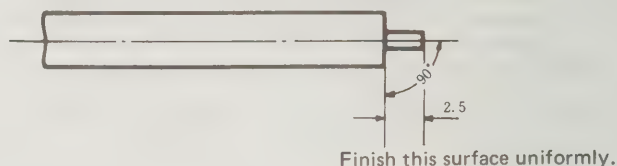
Let the center conductor of the cable protrude 2.5mm and remove the outer conductor and insulation.

Note 1: Finish the outer conductor and insulation vertically and uniformly with a fret saw or the like.

Note 2: When cutting, be careful not to damage the center conductor.

Fig.(16)

.141-inch semi-rigid cable



(2) Solder the center conductor of the cable to the male contact of the connector. (Refer to Fig. (17).)

i) Fit HRM-T-2 so that the female contact of the connector and the insulation will not move, and hold it firmly in place with a vice.

ii) Remove the screw cover, insert the cable after end processing as shown in Fig. (16) through the cord inlet, and solder it as shown in Fig. (17).

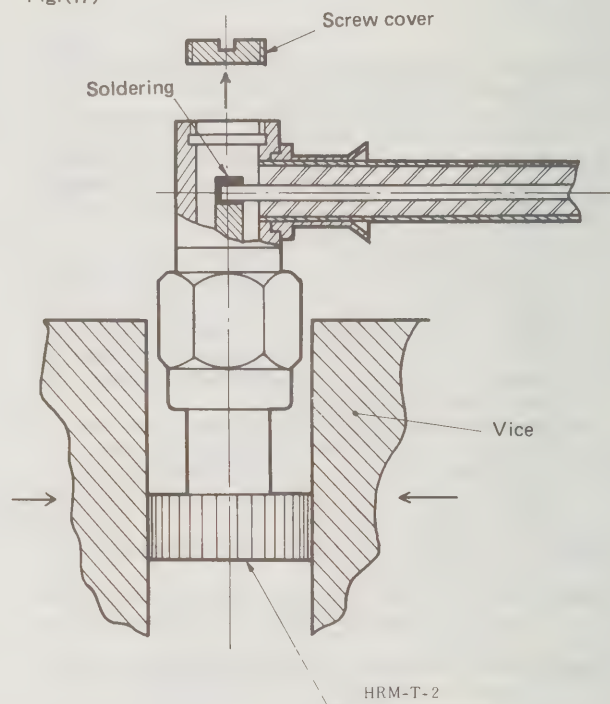
Note 1: Insert the cable until the tip of the outer conductor comes into contact with the inner surface of the connector shell, as shown in Fig. (17). Insert the center conductor into the groove of the male contact of the connector, and solder it.

Note 2: When soldering, be careful not to get solder on the center conductor of the cable or on the outer surface of the male contact of the connector.

Note 3: It is desirable to use at this time a soldering iron of about 20 ~ 30W. Its tip must be narrowed to facilitate the work.

Note 4: When soldering, be careful to avoid knobby soldering. (To check this point, rotate the cable after soldering.)

Fig.(17)



(3) Solder the outer conductor.

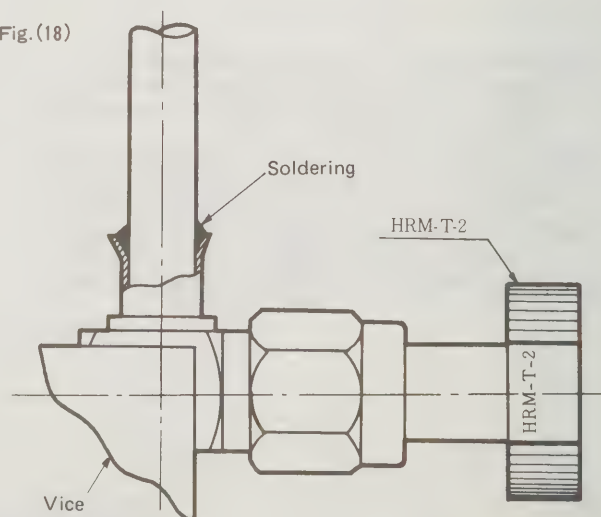
Fit HRM-T-2 into the opening part as shown in Fig. (18), hold it in a vice, and solder the outer conductor of the cable and the connector shell.

Note 1: It is desirable to use at this time a soldering iron of about 80W.

Note 2: Apply the solder uniformly on the circumference, and carry out the soldering as speedily as possible.

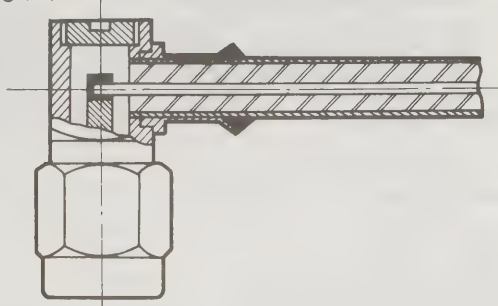
Note 3: Polish the soldered part of the cable in advance with sandpaper or the like so that the solder will adhere easily to it.

Fig.(18)



- (3) Remove the locator and screw on the screw cover. Then the wiring connections will be completed, as shown in Fig. (19).

Fig. (19)



Addendum

When connectors of the HRM series are to be connected and used with semi-rigid cables, their performance properties, like those of other types of connectors, will be governed largely by the quality of the wiring connection work. The same thing can be said with reference to connection of the wiring of flexible cables as well. However, in cases where even better performance characteristics are needed, the precautions described above must be observed. When semi-rigid cables are to be bent in use, tools like those shown in Fig. (20) (HRM-T-5, 9) can be used to bend them with radii of curvature of 6R, 8R, 10R or 12R, respectively. If they are to be used in a spiral shape, the rear surfaces of (HRM-T-5, 9) are used. This is shown in the photograph. Fig. (21) shows the V.S.W.R. data for semi-rigid cables that are connected in bent shape as shown in the photograph and for those that are connected straight. It is clear that there are no large differences in the characteristic features.



Fig. (20)

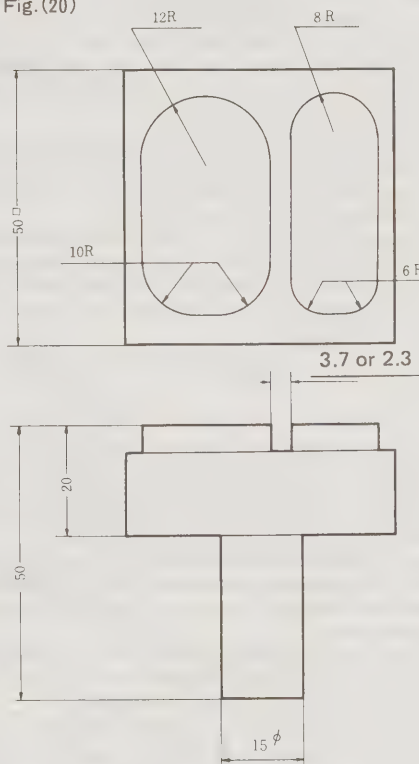
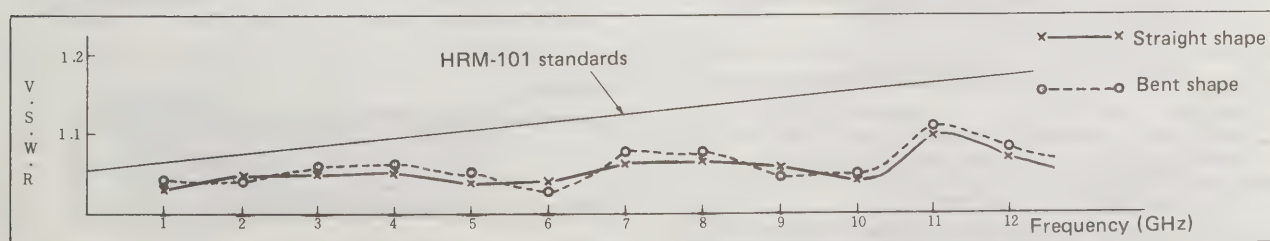


Fig. (21)



4. HRM-202, 202S

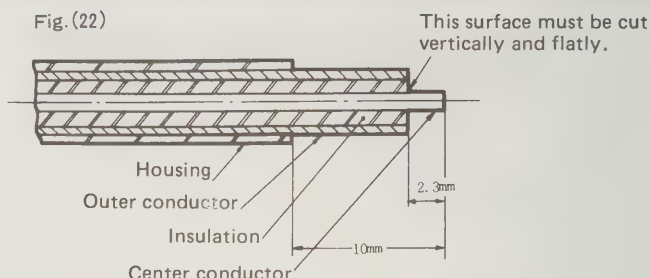
(1) Process cable ends (Refer to Fig. (22).)

- i) Cut off 10mm of the outer covering of the cable (RG-142B/U or 3D-2W (Irrax cable)). Next cut off the outer conductor and insulation so that 2.3mm of the center conductor will protrude.

Note 1: When cutting the housing and insulation, be careful not to damage the outer conductor and the center conductor.

Note 2: Be sure to cut the cable insulation vertically and flatly.

Fig. (22)



(2) Solder the center conductor

Hold the male contact for HRM-202 in place with a vice as shown in Fig. (23) and solder it to the center conductor of the cable.

Note 1: Before soldering, apply preliminary solder on the male contact in advance.

Note 2: It is a good idea to make a hole of 0.8ϕ , as shown in Fig. (23), at the part where the male contact is to be held in the vice.

Note 3: In the case of cables using Irrax insulation, such as 3D-2W, be careful to perform the soldering speedily so that the tip will not dissolve as a result of the heat during soldering.

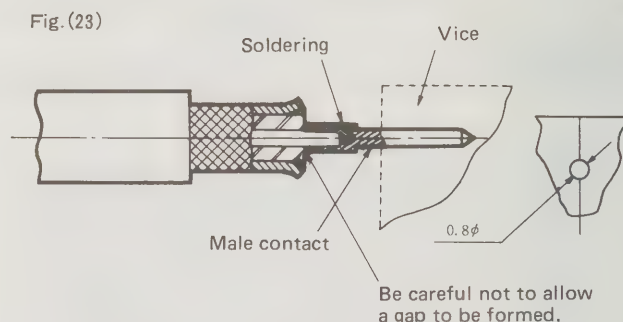
Note 4: The build-up of solder after soldering must be finished uniformly on the circumference. To check the strength of the soldering, pull the male contact with a force of about 1kg (2.47 lb.).

Note 5: Be careful not to allow a gap to be produced between the insulation and the contact after soldering.

Note 6: Be careful not to allow the male contact to be soldered in a bent position towards the center conductor of the cable.

Note 7: It is desirable to use a soldering iron of about 20 ~ 30W.

Fig. (23)



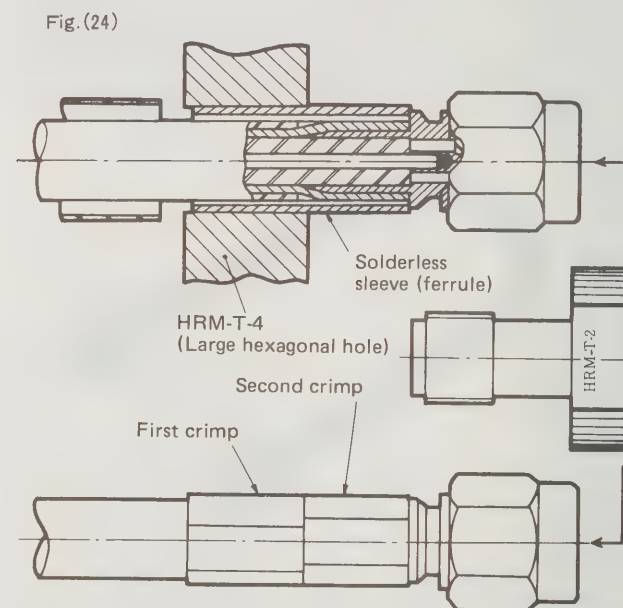
(3) After passing the boot and solderless sleeve over the cable, insert the cable through the connector shell cord inlet, and crimp the ferrule (sleeve) in a hexagonal shape with HRM-T-4. (Refer to Fig. (24).)

- i) To insert the cable, align the male contact with the hole in the insulation, and insert the connector shell between the dielectric material of the cable and the outer conductor.

- ii) Insert the ferrule (sleeve) until it strikes against the uneven part of the shell, as shown in Fig. (24), and crimp it in a hexagonal shape with HRM-T-4.

Note 1: Insertion of the cable is finished when the uneven part of the male contact strikes against the connector insulation. It is a good idea to fit the HRM-T-2 (the locator) in the opening part in order to prevent the connector insulation from moving at this time. Crimping of the ferrule (sleeve) is performed first on the cable side and next on the connector side. (Be careful about the order; if the wrong order is followed, the clamping force will be reduced by one half.).

Fig. (24)

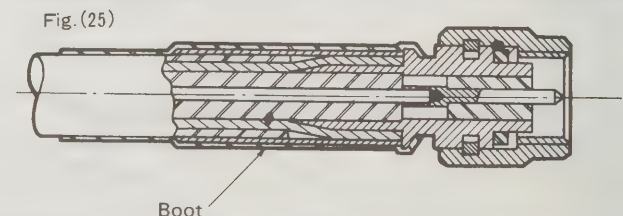


(4) Put on the boot over the ferrule (sleeve), and apply heat with a hair dryer or the like to cause shrinking. When the connection of the wiring is completed, the appearance will be as shown in Fig. (25).

Note 1: When shrinking, catch the boot on the groove in the shell, as shown in Fig. (25).

Note 2: Remove HRM-T-2 (the locator) after shrinkage of the boot.

Fig. (25)



HRM SERIES RF CO-AXIAL CONNECTORS

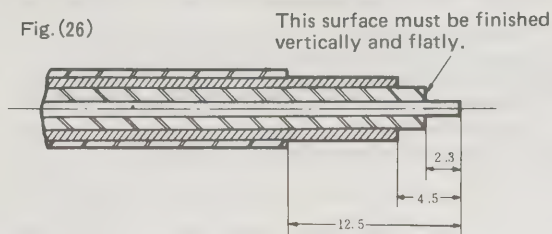
5. HRM-204, 204S, 206, 206S

- (1) Process the cable ends
 - i) Cut off 12.5mm of the outer covering of the cable (RG-142B/U or 3D-2W (Irrax)).
 - Next cut off 4.5mm of the outer conductor, and also cut off 2.3mm of the insulation.

Note 1: When cutting the outer covering and insulation, be careful not to damage the outer conductor and the center conductor.

Note 2: Cut the cable insulation vertically and flatly.

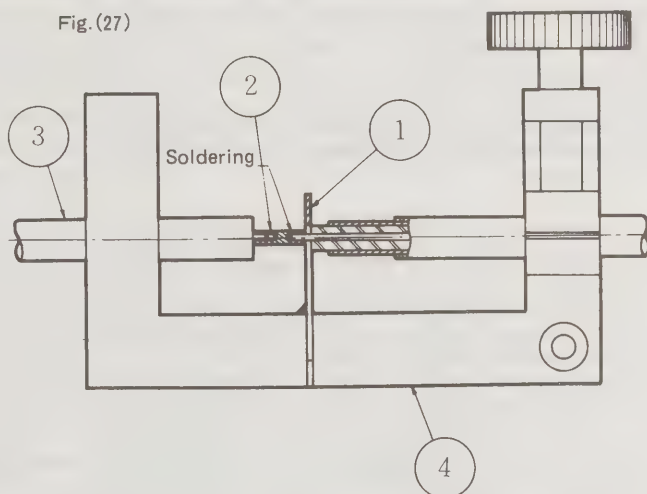
Fig. (26)



- (2) Solder the center conductor.

Using HRM-T-6, solder the center conductor by the same procedure as in HRM-102 and HRM-103. (Refer to Fig. (27).)

Fig. (27)



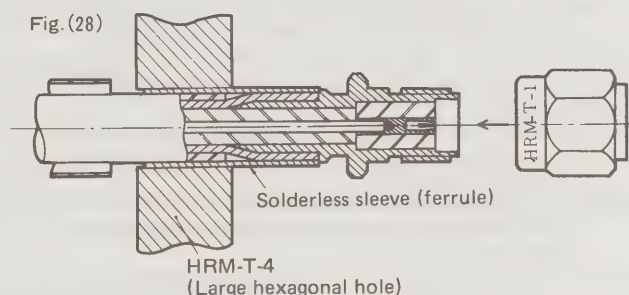
- (3) After passing the boot and ferrule (sleeve) over the cable, insert the cable through the connector-shell cord inlet, and crimp the ferrule (sleeve) in a hexagonal shape with HRM-T-4. (Refer to Fig. (28).)
 - i) To insert the cable, align the female contact with the hole in the insulation, and insert the connector shell between the insulation of the cable and the outer conductor.
 - ii) Insert the ferrule (sleeve) until it strikes against the uneven part of the shell, as shown in Fig. (28), and crimp it in a hexagonal shape with HRM-T-4.

Note 1: Spread out the tip in order to make it easy to insert the outer conductor of the cable.

Note 2: Insertion of the cable is finished when the cable insulation strikes against the connector insulation. HRM-T-1 (the locator) is to be fitted in place in order to prevent the connector insulation from moving at this time.

Note 3: Crimping of the ferrule (sleeve) is performed first on the cable side and next on the connector side. (Be careful about the order; if the wrong order is followed, the clamping force will be reduced by one half.)

Fig. (28)

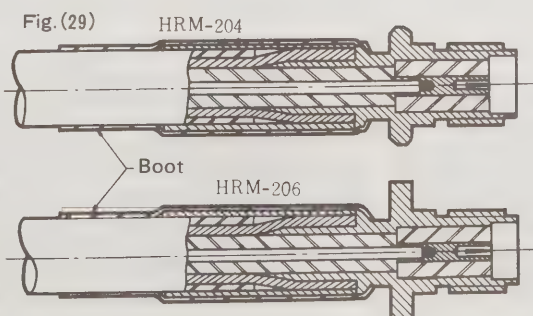


- (4) Put on the boot over the ferrule (sleeve), and apply heat with a hair dryer or the like to cause shrinking. When the connection of the wiring is completed, the appearance will be as shown in Fig. (29).

Note 1: When shrinking, catch the boot on the groove in the shell, as shown in Fig. (29).

Note 2: Remove HRM-T-1 (the locator) after shrinkage of the boot.

Fig. (29)



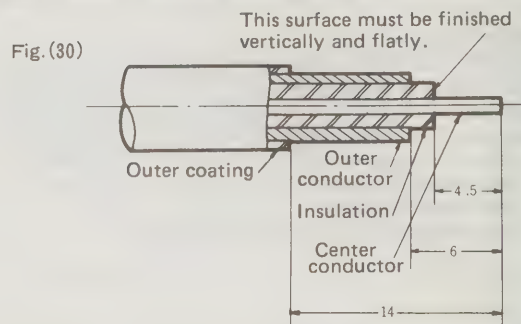
6. HRM-208, 208S

(1) Process the cable ends

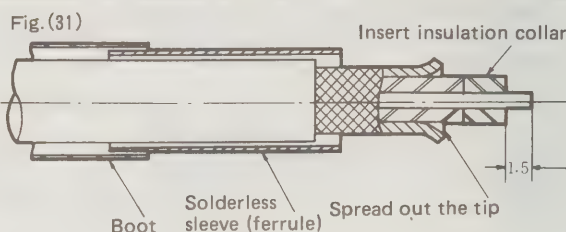
Process the cable ends as shown in Fig. (30).

Note 1: When cutting the outer covering and insulation, be careful not to damage the outer conductor and the center conductor.

Note 2: Cut the insulation vertically and flatly.



(2) Pass the boot and ferrule (sleeve) over the cable and spread out the tip of the outer conductor. (Refer to Fig. (31).)



(3) Solder the center conductor and crimp the ferrule (sleeve).

i) Fit HRM-T-1 (the locator) in place in order to prevent the connector male contact and insulation from moving, and hold it firmly in place with a vice.

ii) Remove the connector cover and insert the cable through the cord inlet, as shown in Fig. (32), aligning the center conductor of the cable with the groove at the connector male contact.

iii) Solder the center conductor of the cable to the male contact at the position where the cable insulation strikes against the male contact.

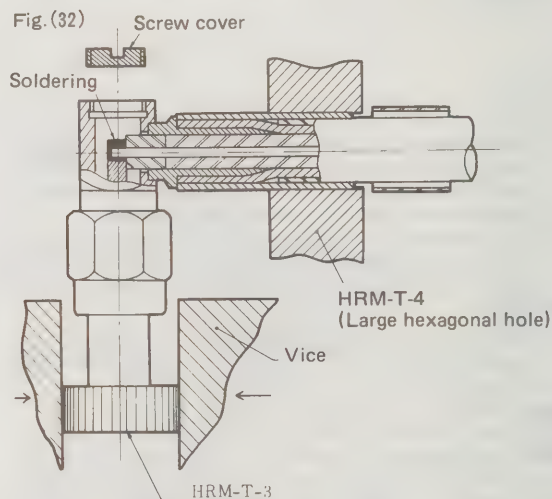
iv) After the soldering, check to make sure whether or not it has been carried out perfectly by pulling the cable with a force of about 1 kg of weight. Next insert the ferrule (sleeve) over the outer conductor of the cable until it strikes against the uneven part of the shell, and crimp it in a hexagonal shape with HRM-T-4.

Note 1: Perform the soldering carefully, making sure not to deposit solder on the outer surface of the male contact of the connector.

Note 2: It is desirable to use a soldering iron of about 20 ~ 30W. Its tip must be narrowed so as to make the work easy.

Note 3: Soils on the inside of the connector produced as a result of soldering should be washed off with thinner or the like in order to prevent the occurrence of faulty insulation or inadequate withstand voltage.

Note 4: Crimping of the ferrule (sleeve) is performed first on the cable side and next on the connector side. (Be careful about the order; if the wrong order is followed, the clamping force will be reduced by one half.)

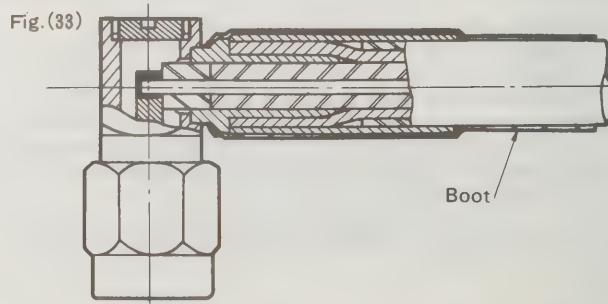


(4) Put on the boot over the ferrule (sleeve), and apply heat with a hair dryer or the like to cause shrinking. Then remove the locator from the opening part and tighten the screw cover.

When the connection of the wiring is completed, the appearance will be as shown in Fig. (33).

Note 1: When shrinking, catch the boot on the groove in the shell, as shown in Fig. (33).

Note 2: Remove HRM-T-2 (the locator) after shrinkage of the boot.



Overview

The MP (Micro Push-on) series is a series of ultra-small-size 75Ω coaxial connectors which were developed by mobilizing our company's outstanding technical abilities to meet the requirements of high-density mounting, smaller size and lighter weight, and adoption of unit structures and improved performance characteristics. These requirements have been demanded in various devices recently.

The "push-on" system has been adopted in the MP series, and size-wise the connectors in this series have an ultraminiaturized design which is believed to be the ultimate for any 75Ω coaxial connectors. The "one-touch solderless" technique is used in the outer conductors, aiming at attaining epoch-making improvements in the wiring connection, which was the biggest problem in high-frequency connectors in the past. The matching cables are 2.5C-XW (Irrax cables) and 2.5C-2W. They can be used in the frequency bands of 140MHz or lower, which are ordinarily called the intermediate-frequency bands, but they are suitable for **various types of microwave communications equipment, various types of radio equipment, satellite communications equipment, measuring instruments, etc.**



Characteristic Features

Compact in size and lightweight

They are extremely compact in size and lightweight. The plugs have a maximum outside diameter of 8.7ϕ and an overall length of 16.5mm, and the receptacles have a maximum outside diameter of 10ϕ and an overall length of 15.4mm. Thus, they are most suitable for high-density mounting. The receptacles are of the bulkhead type, which can be mounted from either the front or the rear of the panel.

Good performance characteristics, high reliability

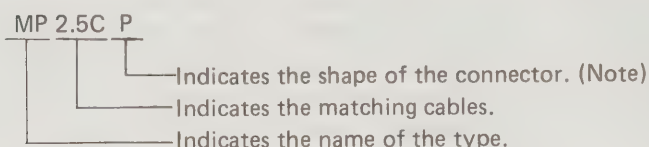
The MP series consists of products that were developed from the beginning on the basis of cost effectiveness with low total cost. This includes good performance characteristics, high reliability and good workability. Their electrical and mechanical performance characteristics and their resistance to vibration have been confirmed, and their excellence is guaranteed. In particular, since their opening parts are covered with outer cylinders, they have a reliability against twisting which is several stages superior to that of the small size coaxial connectors of the past.

Superior connection of wiring

The one-touch solderless system has been adopted for connecting the wiring. In order to deal with the difficulties of handling (following the miniaturization of the individual parts) the units have been organized in blocks as much as possible, and ease of handling has been set as a goal. Thanks to this new system, inconsistencies in the work of connecting the wiring from one operator to another are eliminated, and high reliability is ensured. In addition, thanks to the adoption of this connecting system, the connecting time has been greatly reduced to a fraction of that needed in the connectors of the past.

Types

The part numbers in the MP series have the following configuration:



(Note) P indicates "plug."

R indicates "receptacle."

LP indicates "L-type plug."

LR indicates "L-type receptacle."

RP indicates "receptacle-type plug."

PA-JJ indicates a panel adapter with an opening part with jacks on both ends.

P75 indicates a plug-type 75Ω dummy load (terminator).

Main materials used

Parts	Materials	Finish
Shell	Brass	Nickel plating
Insulation	Tetrafluoride resin	
Male contact	Brass	Gold plating
Female contact	Beryllium copper	Gold plating
Cord pipe	Brass	Nickel plating
Nut	Brass	Nickel plating
Solderless sleeve (ferrule)	Copper	Nickel plating
Screw ring	Beryllium copper	Nickel plating
	Phosphor bronze	Nickel plating
Cord covering	Heat-shrinkable tubing	

Main performance characteristics

Item	Standard value
Contact resistance	5mΩ or less at 1A DC
Insulation resistance	1000MΩ or less at 500V DC
Withstand voltage	1000V AC (rms) for 1 minute
Characteristic impedance	75Ω
Voltage standing wave ratio	1.05 or less at DC ~ 140MHz
Contact life	500 times
Temperature-resistance cycles	Checked at -55 to 85°C according to NDS XC 0152C-102, condition D.
Corrosion resistance	Checked according to NDS XC 0152C-101B, condition B.
Vibration resistance	Checked at an amplitude of 1.5mm and an acceleration of 10G according to NDS XC 0152C-204B, condition A.
Impact resistance	Checked at 50G according to NDS XC 0152C-202B.

Cable connectors

A large number of cables are conceivable as the matching cables for the connectors, but connectors which can be used with 2.5C-XW (Irrax cables) and 2.5C-2W are manufactured as the standard products, taking into consideration the double braiding of their outer conductors, which results in little high-frequency leakage.

Type of cable	Outer diameter of center conductor	Outer diameter of insulation	Outer diameter of outer conductor	Maximum outer diameter	Insulation material	Characteristic impedance
2.5C-XW (Irrax cable)	0.40φ±0.01	2.5φ	3.5φ (Double)	4.5φ	Irrax (Irradiated polyethylene)	75Ω
2.5C-2W	0.40φ±0.01	2.4φ	3.6φ (Double)	4.6φ	Polyethylene	75Ω

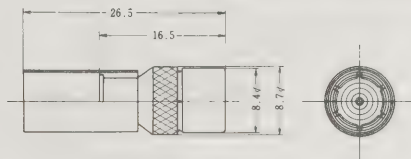
Use cables having the dimensions in the table above.

MP SERIES RF CO-AXIAL CONNECTORS



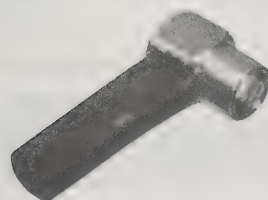
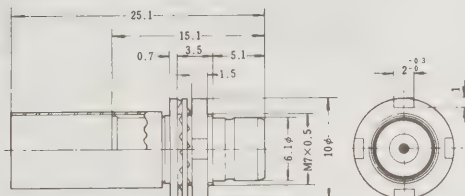
MP2.5CP

Part No.	Applicable cables	Remarks
* MP2.5CP	2.5C-XW (Irrax), 2.5C-2W	Plug



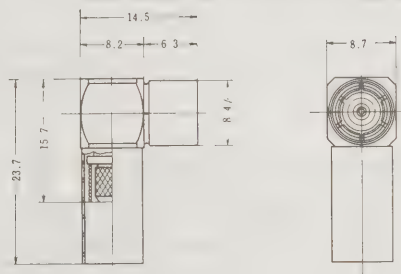
MP2.5CPJ

Part No.	Applicable cables	Panel thickness	Remarks
* MP2.5CPJ	2.5C-XW (Irrax), 2.5C-2W	0.5~1mm	Panel jack

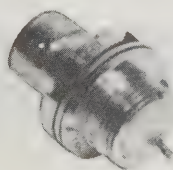


MP2.5CLP

Part No.	Applicable cables	Remarks
* MP2.5CLP	2.5C-XW (Irrax), 2.5C-2W	L-type plug

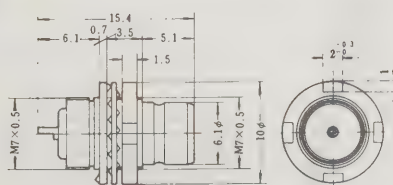


Receptacles

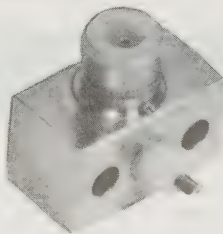


MP2.5CR

Part No.	Panel thickness	Remarks
* MP2.5CR	On fitting part side: 0.5~1mm On connecting part side: 0.5~0.8mm	Receptacle

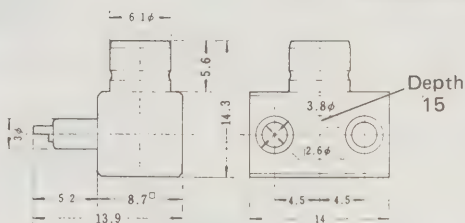


MP SERIES RF CO-AXIAL CONNECTORS

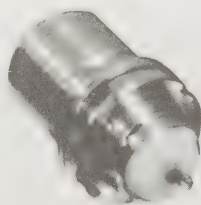


MP2.5CLR

Part No.	Remarks
MP2.5CLR	L-type receptacle

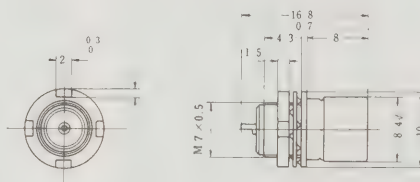


Receptacle plug



MP2.5CRP

Part No.	Panel thickness	Remarks
MP2.5CRP	0.5~1.8mm	Receptacle plug

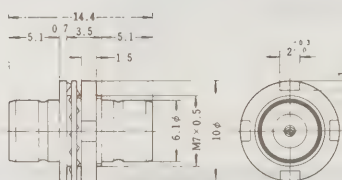


Adapter



MP2.5CPA-JJ

Part No.	Panel thickness	Remarks
MP2.5CPA-JJ	0.5~1mm	Panel adapter



Accessories



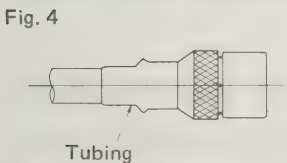
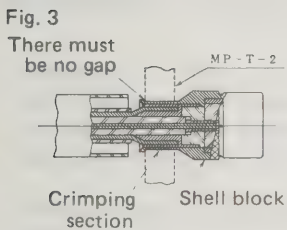
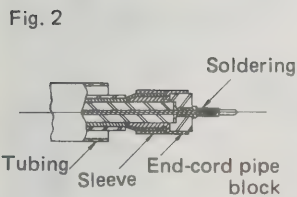
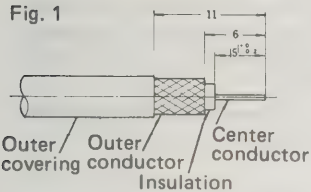
MP2.5CP75

Part No.	Rated power	Remarks
MP2.5CP75	1/8W	75Ω resistive terminator (plug-type opening)



Connecting Methods

Circuit diagrams of MP2.5CP, MP2.5CPJ



1. End processing Fig. 1

1) Process the ends of the matching cables as shown in Fig. 1.

Note 1) Be sure not to disentangle the outer conductor.

2. Connecting the wiring of the center conductor . . . Fig. 2

- 1) Pass the tubing and sleeve through the cable, in that order.
- 2) Insert the cable into the end-cord pipe block.
- 3) Insert the sleeve until it strikes against the end-cord pipe block, as shown in Fig. 2.

4) Solder the center conductor to the end as shown in Fig. 2.

Note 1) Pull the cable slightly (about 50g) in order to check the connections of the wiring.

3. Connecting the wiring of the outer conductor Fig. 3

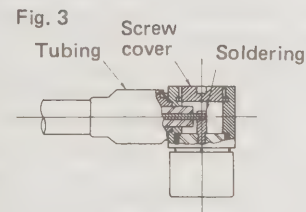
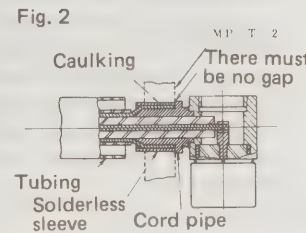
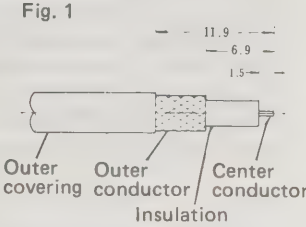
- 1) Insert the aforesaid block into the shell block as far as the prescribed position.
- 2) Perform hexagonal crimping on the connector shell with the dedicated fixture (MP-T-2), as shown in Fig. 3.

4. Setting the tubing Fig. 4

- 1) Pass the tubing through the connector, as shown in Fig. 4.
- 2) Apply heat by means of a hair dryer or the like in order to cause the tubing to shrink.

Note 1) In the case of MP2.5CPJ, bring the tubing into contact with the collar and apply heat.

Circuit diagrams of MP2.5CLP



1. End processing Fig. 1

1) Process the ends of the matching cables as shown in Fig. 1.

Note 1) Be sure not to disentangle the outer conductor.

2. Connecting the wiring of the outer conductor Fig. 2

- 1) Pass the tubing and solderless sleeve through the cable, in that order.
- 2) Insert the cable into the shell proper.
- 3) Insert the solderless sleeve until it strikes against the shell proper, as shown in Fig. 2.

4) Perform hexagonal caulking on the solderless sleeve with the dedicated fixture (MP-T-2), as shown in Fig. 2.

3. Connecting the wiring of the center conductor Fig. 3

- 1) Solder the center conductor to the contact.
- 2) Screw the screw cover into the shell proper.

4. Setting the tubing Fig. 3

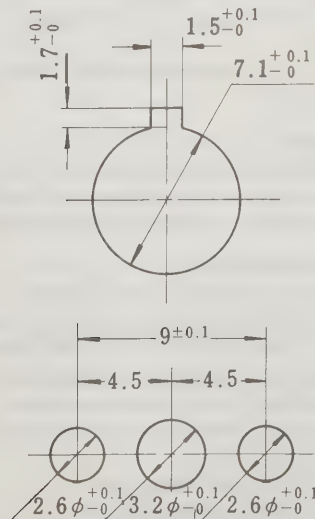
- 1) Pass the tubing over the connector, as shown in Fig. 3.
- 2) Apply heat by means of a hair dryer or the like in order to cause the tubing to shrink.

Drawings of holes drilled to mount on panel

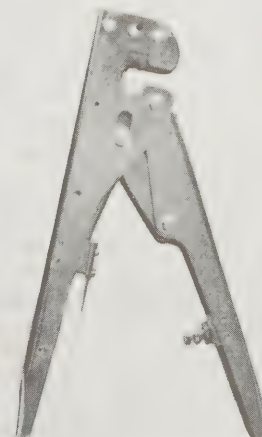
Crimp Tool

MP2.5CR·MP2.5CPJ·MP2.5CRP·MP2.5CPA-JJ

MP2.5CLR



MP-T-2
(for outer conductor)



INFORMATION

The POB (Push-on Lock Connectors Type B) series consists of high-performance small-size push-on lock coaxial connectors having original coupling parts which were developed for microwave-band use.

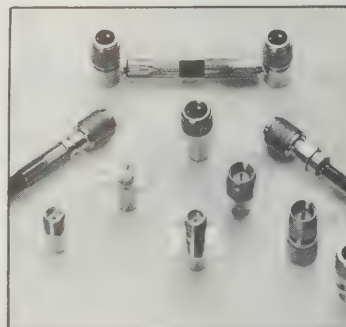
Mounting and removing can be performed in a shorter time than in the familiar HRM series of small-size coaxial connectors for microwave-band use. In addition, mounting and removing can be performed without using a torque wrench. Therefore, the mounting density can be increased.

By using the POB series, the adjusting time in sets can be shortened, the maintenance work can be speeded up, and the economical effect is displayed to the fullest.

Uses

The POB series is suitable for in-unit wiring in wired and wireless communications equipment, broadcasting equipment, radar equipment and electronic measuring instruments, for connections between units, and for input/output terminals of equipment components.

In particular, they facilitate the complicated and high-density processing of in-unit wiring and the mounting and removing work in multi-stage unit coupling. Moreover, they are most suitable for sets in which it is necessary to ensure excellent transmission characteristics.



Characteristic features

1. Good performance characteristics

The structure and dimensions of the transmission path and the structure in which the center contact and the dielectric materials are fastened have been unified between the POB series and the HRM series. Therefore, the POB series has high-frequency characteristics as good as those of the HRM series and mechanical characteristics as stable as those of the HRM series.

The coupling part also has a structure with an innovative spring function unit, which has been designed so that the electrical standard surfaces are always in contact, and an outer cylinder which protects the spring function unit and provides excellent protection, thus ensuring high stability and reliability.

2. Mounting and removal are easy.

There are the following advantages in mounting and removal in comparison with the HRM series, which is of the screw-lock type.

- (1) Mounting and removal does not take time and can be carried out almost instantaneously.
- (2) Even in a configuration like that of a U link, in which connectors are attached to both ends of a short semi-rigid cable, there is no need to go to the trouble of aligning the coupling depths of both sides when mounting and removing, as is necessary in the HRM series.
- (3) The structure used is a complete one in which both the center and outer contact springs are not damaged even if the cable is twisted when there is incomplete coupling.
- (4) Since mounting and removal can be performed with the fingers, there is no need to provide spanners or torque wrenches.

3. The mounting density can be raised.

The sizes and weights of the POB series are almost the same as those of the HRM series. However, the mounting density can be raised because, unlike the HRM series, torque wrenches are not used, when inserting or withdrawing the POB series.

4. The series is compatible with the HRM series.

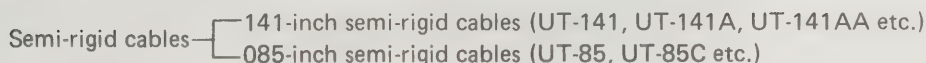
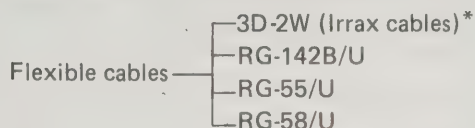
The POB series has been given the greatest possible compatibility with the HRM series in the following points. Consequently, when changing over from the HRM series or combining both series, there are very few cases in which the set designs need to be changed, new connecting tools or standard work instruction manuals need to be provided, or guidance is required in the work of connecting the wiring.

- (1) The method of mounting on the set and the mounting dimensions
- (2) The size, weight and electrical length
- (3) Types of standard cables with which the series matches
- (4) Methods of connecting the wiring and connecting tools

POB SERIES RF CO-AXIAL CONNECTORS

Standard cables

The following are the standard cables of the POB series:

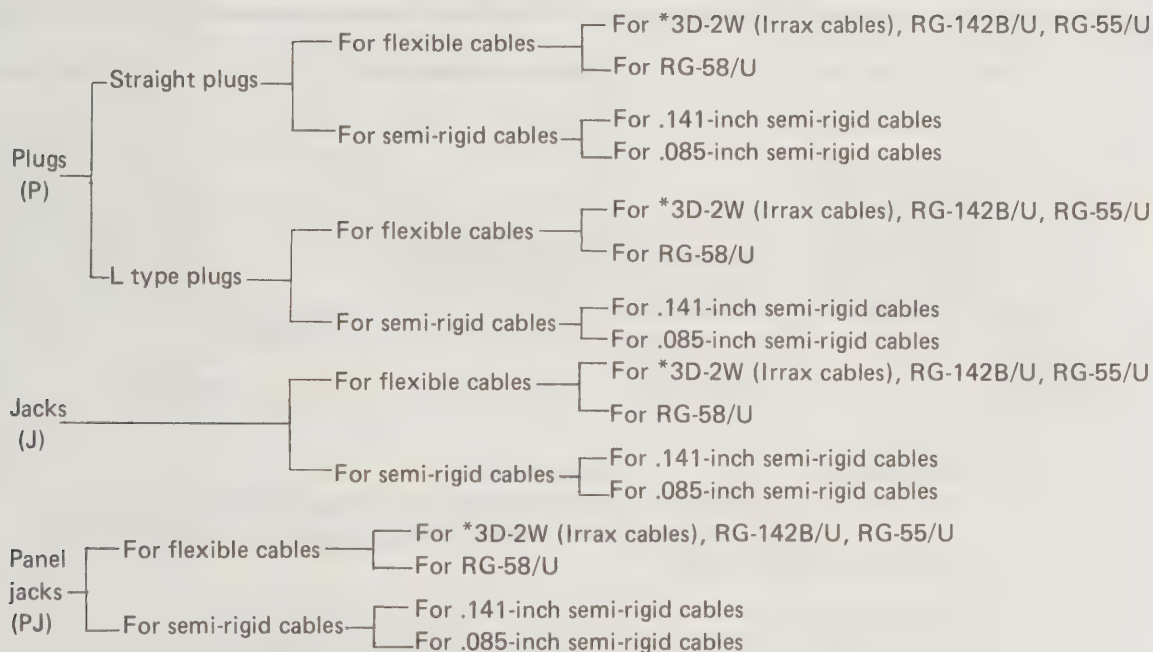


* These cables are different from the 3D-2W cables in the JIS standards and NTT specifications. Please purchase from Sumitomo Electric Industries, Ltd. cables with the dimensions given on p. 105.

The deminsions of the standard cables are listed on p. 105.

Types

The POB series is classified into the following types:



*One product can be shared.

Receptacles (R) ————— Various types

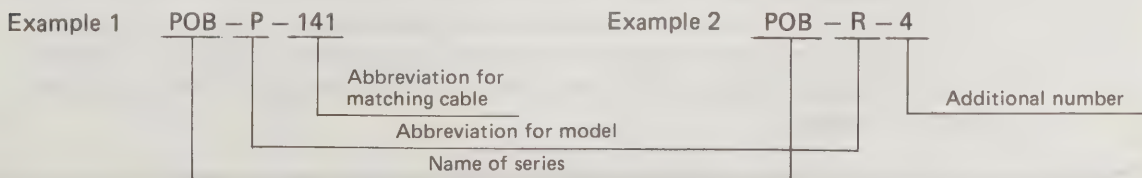
Plug receptacles (RP) ————— Various types

Adapters (A•PA•LA) ————— Various types

Conversion adapters ————— Various types

Dummy loads (TMP) ————— Plug dummy loads, jack dummy loads

The names of the types have the following configurations:



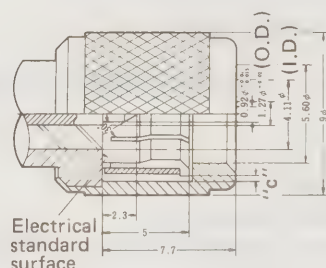
RF CO-AXIAL CONNECTORS

Main materials used

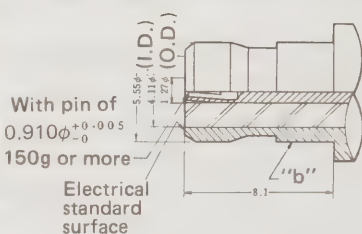
Parts	Materials		Finish	
	Materials	Applicable standards	Plating	Plating thickness
Shell	Brass	JIS H 3250	Gold plating	0.5 ~ 1 micron
Outer cylinder	Brass	JIS H 3250	Nickel plating	3 microns
Female contact	Beryllium copper	JIS H 3270	Gold plating	2 ~ 3 microns
Male contact	Brass	JIS H 3250	Gold plating	2 ~ 3 microns
Solderless sleeve (ferrule)	Annealed copper		Nickel plating	3 microns
Insulation	Tetrafluoride resin			
Cord covering	Fluororesin			

Coupling parts

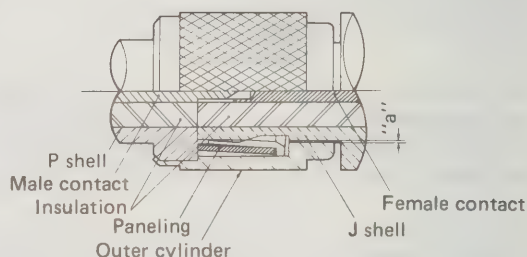
Male coupling part



Female coupling part



Coupled state



Explanation 1:

The dimensions of the transmission path (the inner and outer diameters of the center contact and the inner diameter of the shell with the insulation inserted) are the same as those of the HRM series.

Explanation 2:

Tapered parts are provided on the spring part of the male coupling part and on the outer diameter part of the female coupling part. Therefore, the spring force is dispersed in the radial and axial directions, where it operates as the coupling force and as the top touch force on the electrical standard surface, respectively.

Explanation 3:

Gap "a" between the inner diameter of the outer cylinder and the outer diameter of the J shell is 0.05mm or less, and its moving angle is suppressed to 23 minutes or less in order to minimize to the utmost the load applied to the contact spring (both the center and outer) even if the cable is twisted in the coupled state.

Explanation 4:

The dimensions are planned so that the center contacts will not couple together unless part “b” (5.55ϕ) of the J shell is inserted into the outer cylinder (with the exception of the tapered part of the male contact. Therefore, the center contact springs will not be damaged even if the cable is twisted when the coupling state is imperfect. Moreover, since the gap “c” between the P shell and the outer cylinder is set at $0.2 \sim 0.3$ mm and the movable distance of the spring part is suppressed, the outer contact spring will not be damaged.

POB SERIES RF CO-AXIAL CONNECTORS

Performance characteristics

Items		Performance characteristics	
Structure, dimensions	Structure	Refer to individual drawings	
	Dimensions	Dimension of coupling parts: see p.94. External dimensions: see p. 96 ~ 102.	
Electrical characteristics	Insulation resistance	5000MΩ or more measured at 500V DC	
	Withstand voltage	Test voltage 1000V AC (rms) (at normal pressure)	
	Contact resistance	4MΩ or less at both center contact and outer contact	
	Characteristic impedance	50Ω	
	Frequency range	DC ~ 12.4GHz	
	Voltage standing wave ratio (V.S.W.R.)	Connector for .141-inch semi-rigid cables	<div> <div>Straight type</div> <div>L-bent type</div> </div> <div> DC ~ 6GHz, 1.15 or less DC ~ 6GHz, 1.2 or less </div> <div> 6 ~ 12.4GHz, 1.2 or less 6 ~ 12.4GHz, 1.25 or less </div>
		Connectors for flexible cables	<div> <div>Straight type</div> <div>L-bent type</div> </div> <div> DC ~ 4GHz, 1.25 or less DC ~ 4GHz, 1.25 or less </div> <div> 4 ~ 6GHz, 1.3 or less 4 ~ 6GHz, 1.3 or less </div>
		Note) Values for cases where the cables are RG-142B/U.	
		Receptacles	<div> <div>Straight type</div> <div>L-bent type</div> </div> <div> DC ~ 6GHz, 1.15 or less DC ~ 6GHz, 1.2 or less </div> <div> 6 ~ 12.4GHz, 1.2 or less 6 ~ 12.4GHz, 1.25 or less </div>
		Plug receptacles	<div> <div>Straight type</div> <div>L-bent type</div> </div> <div> DC ~ 6GHz, 1.15 or less DC ~ 6GHz, 1.2 or less </div> <div> 6 ~ 12.4GHz, 1.2 or less 6 ~ 12.4GHz, 1.25 or less </div>
		Adapters	<div> <div>Straight type</div> <div>L-bent type</div> <div>Conversion adapters</div> </div> <div> DC ~ 6GHz, 1.15 or less DC ~ 6GHz, 1.2 or less DC ~ 6GHz, 1.15 or less </div> <div> 6 ~ 12.4GHz, 1.2 or less 6 ~ 12.4GHz, 1.25 or less 6 ~ 12.4GHz, 1.2 or less </div>
		Dummy loads	DC ~ 6GHz, 1.1 or less 6 ~ 12.4GHz, 1.15 or less
Mechanical characteristics	Coupling force (Withdrawing force)	2 ~ 6kg in state where units are actually coupled to each other	
	Center contact holding force	150g or more with steel pin gauge of $0.915\phi_{-0}^{+0.005}$	
	Center contact fastening torque	170g-cm or more	
	Service life	500 times	
Environmental properties	Vibration resistance	Current tripped in 2 microseconds or less when tested by the method of JIS C5025, Type I-B.	
	Impact resistance	There must be no abnormalities when tested by MIL-STD-202, Method 107D, test condition B.	
	Humidity resistance	There must be no abnormalities when tested by the method of JIS C5024 Type A.	
	Corrosion resistance	There must be no abnormalities when tested by the method of JIS C5028.	

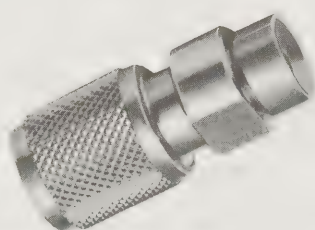
POB SERIES RF CO-AXIAL CONNECTORS

Guide to products

The following are the typical products in the POB series. We also accept orders for designing and production according to special specifications. Client orders are invited.

Connectors for semi-rigid cables

The connectors for semi-rigid cables match two types of cables: .141-inch and .085-inch semi-rigid cables. .141-inch cables should be used in order to obtain the V.S.W.R. listed on p. 95. .085-inch cables, which have good flexibility, are suitable in cases where the wiring is laid with a high density inside the set. In this case, the V.S.W.R. value will be higher than that of the .141-inch cables.

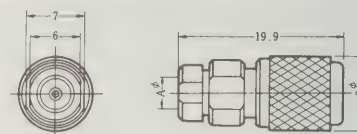


Part No.
POB-P-141
POB-P-85

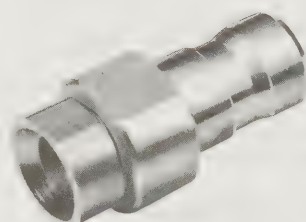
Plugs

-141: for .141-inch semi-rigid cables

-85: for .085-inch semi-rigid cables



Part No.	Aφ
POB-P-141	3.63
POB-P-85	2.25

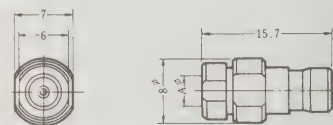


Part No.
POB-J-141
POB-J-85

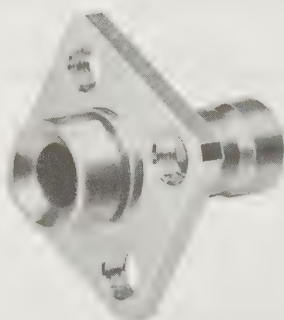
Jacks

-141: for .141-inch semi-rigid cables

-85: for .085-inch semi-rigid cables



Part No.	Aφ
POB-J-141	3.63
POB-J-85	2.25

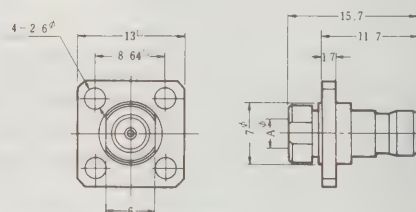


Part No.
POB-PJ-141
POB-PJ-85

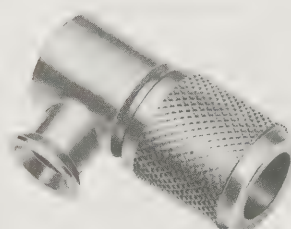
Panel jacks

-141: for .141-inch semi-rigid cables

-85: for .085-inch semi-rigid cables



Part No.	Aφ
POB-PJ-141	3.63
POB-PJ-85	2.25

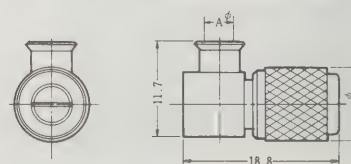


Part No.
POB-LP-141
POB-LP-85

L-type plugs

-141: for .141-inch semi-rigid cables

-85: for .085-inch semi-rigid cables

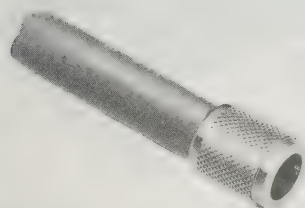


Part No.	Aφ
POB-LP-141	3.63
POB-LP-85	2.25

POB SERIES RF CO-AXIAL CONNECTORS

Connectors for flexible cables

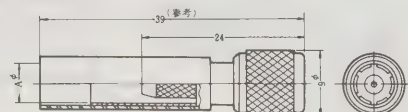
Connectors for flexible cables include those which match RG-55/u, RG-142B/u and 3D-2W (Irrax cables) and those which match RG-58/u. Incidentally, 3D-2W (Irrax cables) are not the same as the 3D-2W cables in the JIS standards or the NTT specifications. Cables with dimensions shown on p.105 should be purchased from Sumitomo Electric Industries, Ltd.



Part No.
* POB-P-55/u
* POB-P-58/u

Plugs

-55/u: For RG-55/u, RG-142B/u and 3D-2W (Irrax cables)
-58/u: For RG-58/u



Part No.	Aφ
POB-P-55/u	5.8
POB-P-58/u	5.1

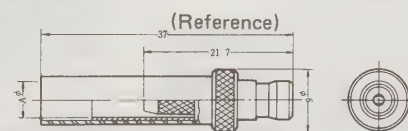


Part No.
POB-J-55/u
POB-J-58/u

Jacks

-55/u: For RG-55/u, RG-142B/u and 3D-2W (Irrax cables)
-58/u: For RG-58/u

RG-142B/u



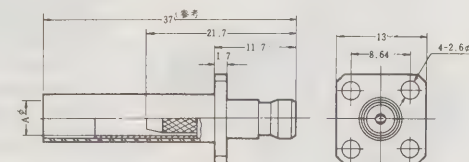
Part No.	Aφ
POB-J-55/u	5.8
POB-J-58/u	5.1



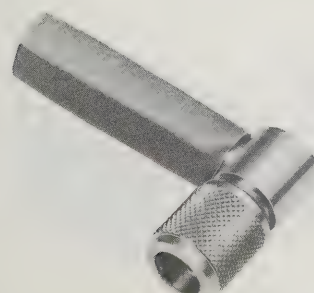
Part No.
POB-PJ-55/u
POB-PJ-58/u

Panel jacks

-55/u: For RG-55/u, RG-142B/u and 3D-2W (Irrax cables)
-58/u: For RG-58/u



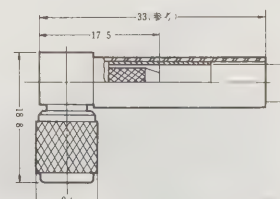
Part No.	Aφ
POB-PJ-55/u	5.8
POB-PJ-58/u	5.1



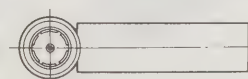
Part No.
* POB-LP-55/u
* POB-LP-58/u

L-type plugs

-55/u: For RG-55/u, RG-142B/u and 3D-2W (Irrax cables)
-58/u: For RG-58/u

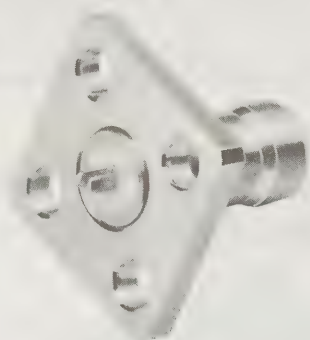


Part No.	Aφ
POB-LP-55/u	5.8
POB-LP-58/u	5.1



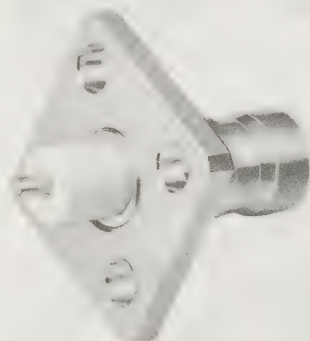
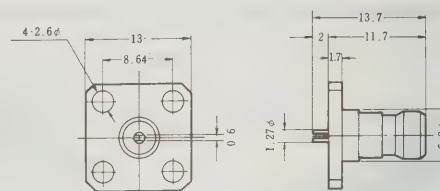
Receptacles

There are the following types of receptacle products. The dimensions for mounting them on the sets have been made compatible with the HRM series.



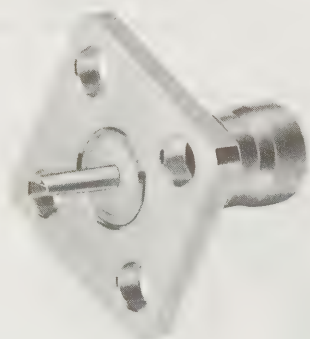
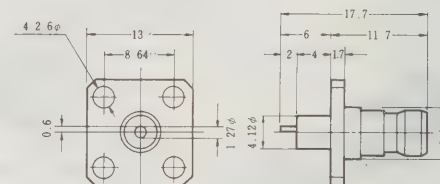
Part No.
POB-R-4

Fastened with machine screws
at four places
Slitter terminals
Straight receptacles



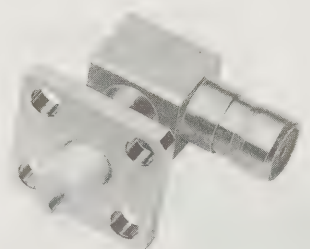
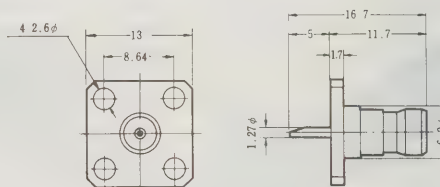
Part No.
POB-R-6

Fastened with machine screws
at four places
Half-cutter terminals
Straight receptacles



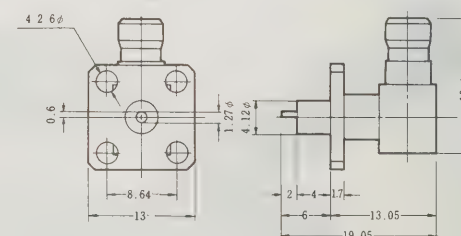
Part No.
POB-R-15

Fastened with machine screws
at four places
Solder terminals
Straight receptacles



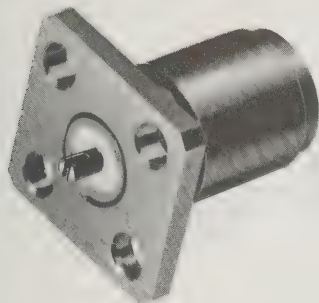
Part No.
POB-LR-5

Fastened with machine screws
at four places
Half cutter terminals
L-type receptacles



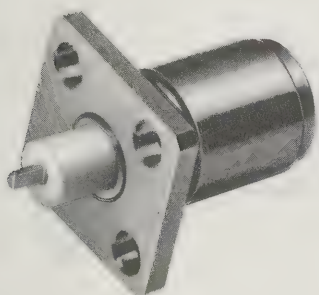
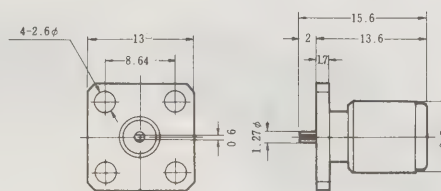
Plug receptacles

There are the following types of plug receptacle products. The dimensions for mounting them on the sets have been made compatible with the HRM series.



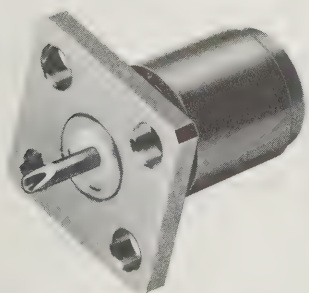
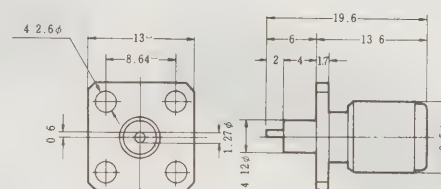
Part No.
POB-RP-4

Fastened with machine screws
at four places
Slitter terminals
Straight receptacles



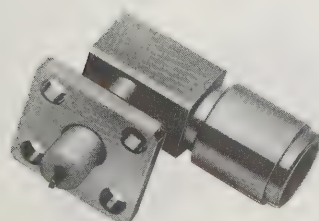
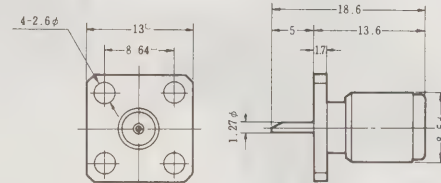
Part No.
POB-RP-6

Fastened with machine screws
at four places
Half-cutter terminals
Straight receptacles



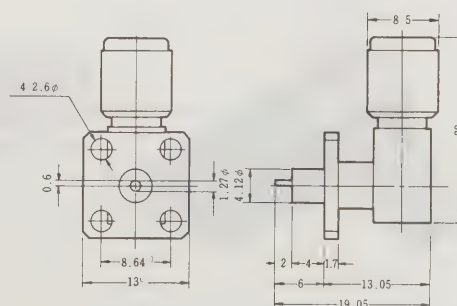
Part No.
POB-RP-15

Fastened with machine screws
at four places
Solder terminals
Straight receptacles



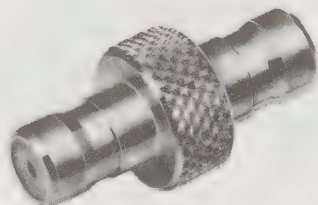
Part No.
POB-LRP-5

Fastened with machine screws
at four places
Half-cutter terminals
L-type receptacles



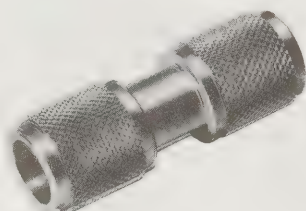
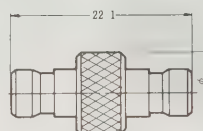
Adapters

There are the following adapters for connecting between coupling parts of the POB series:



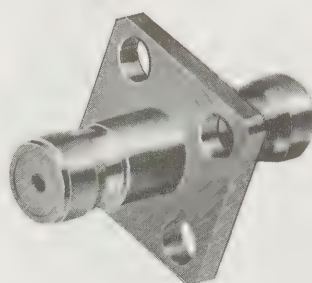
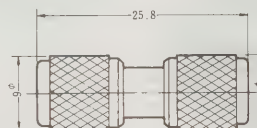
Part No.
POB-A-JJ

Female-female adapter



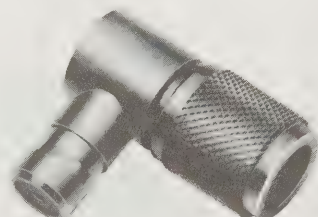
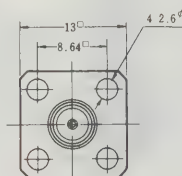
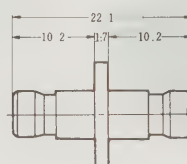
Port No.
POB-A-PP

Male-male adapter



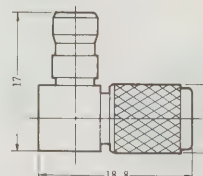
Part No.
POB-PA-JJ

Female-female panel adapter



Part No.
POB-LA

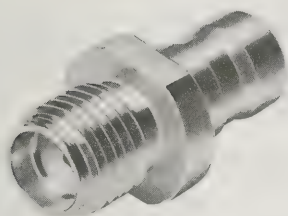
Male-female L-type adapter



POB SERIES RF CO-AXIAL CONNECTORS

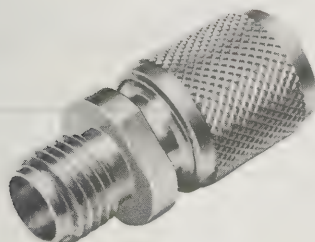
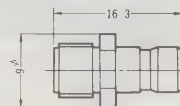
Convesion adapters

There are the following conversion adapters for connecting between the POB series and the HRM series:



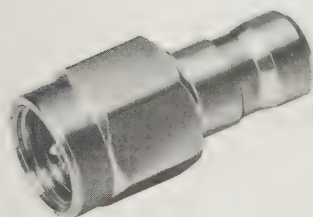
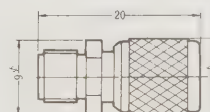
Part No.
HRMJ-POBJ

HRM series female —
POB series female



Part No.
HRMJ-POBJ

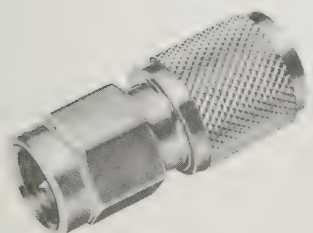
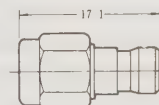
HRM series female —
POB series male



Part No.
HRMP-POBJ

HRM series male —
POB series female

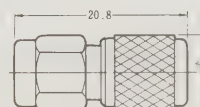
(Flat diameter)



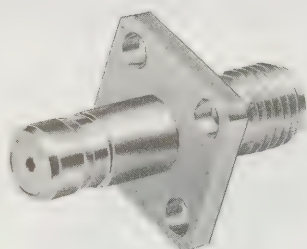
Part No.
HRMP-POBJ

HRM series male —
POB series male

(Flat diameter)

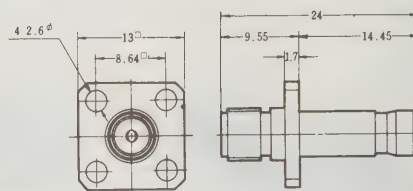


POB SERIES RF CO-AXIAL CONNECTORS



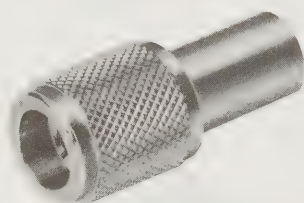
Part No.
HRMJ-POBJ-PA

HRM series female —
POB series female panel
adapter



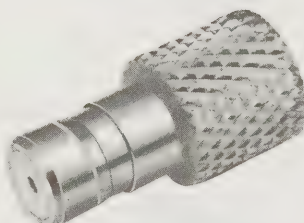
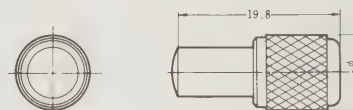
Accessories

As accessories, there are two dummy loads for the male and female coupling parts.



Part No.
POB-TMP-025

Male coupling part dummy
load



Part No.
POB-TMJ-025

Female coupling part
dummy load



POB SERIES RF CO-AXIAL CONNECTORS

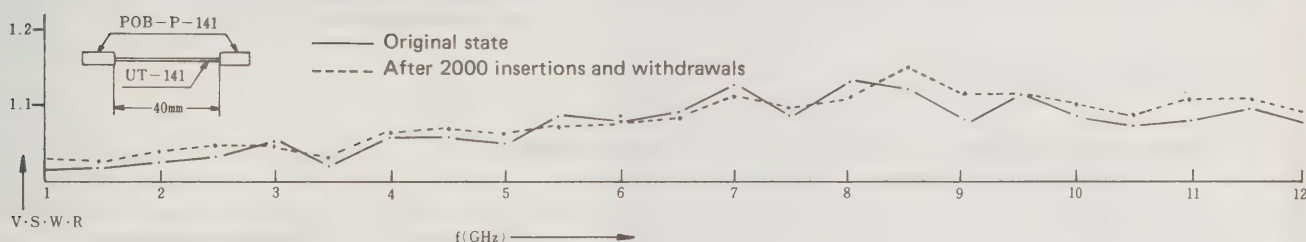
Twisting and changes of the V.S.W.R.

When push-on lock connectors are used in the microwave band, the item which requires greatest attention is whether the high-frequency characteristics will change if the connectors or cables are twisted in the coupled state. In the POB series, there is almost no change of the V.S.W.R. because the moving angle is suppressed to 23 minutes or less on one side even if twisting occurs, as is described on p. 95. Exactly the same applies, naturally, in the original state even after 2000 insertions and withdrawals, which amounts to four times the guaranteed number of insertions and withdrawals.

Number of insertions and withdrawals and deterioration of performance characteristics

1. Deterioration of V.S.W.R.

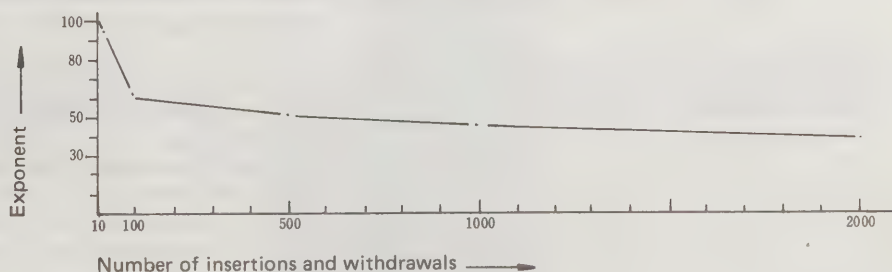
The graph below gives typical data on the V.S.W.R. for the original state and when measured after 2000 insertions and withdrawals with twisting. There are almost no differences between the two pairs of data; this proves that deterioration of the V.S.W.R. has not occurred as a result of insertion and withdrawal.



2. Deterioration of coupling force

The graph below shows the deterioration of the coupling force (withdrawal force) caused by insertion and withdrawal. The deterioration is expressed in terms of an exponent, with the average value of 17 samples as the parameter. By the time of the first 100 insertions and withdrawals, the coupling force decreases rapidly to 60% of its initial value. This is because the internal stress is removed within this period and the male and female coupling parts become "used" to each other. After that, the deterioration changes to the usual type of deterioration caused by fatigue of the spring parts and tends towards stable and leisurely deterioration. The failure ratio during the first 100 times is larger in samples with a stronger initial coupling force. Consequently, it is not the case that in products having an initial coupling force near the lower limit of the guaranteed range the coupling force will be halved after 500 insertions and withdrawals.

Relationship between insertion force and withdrawal force



The coupling force can be divided into the insertion force and the withdrawal force. In the POB series, the withdrawal force is stronger than the insertion force by 40% (maximum), 10% (minimum) or 25% (average) (values using typical data).

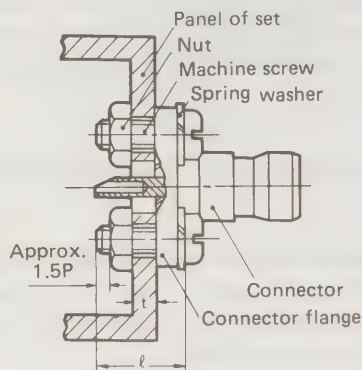
POB SERIES RF CO-AXIAL CONNECTORS

Dimensions for mounting onto the set

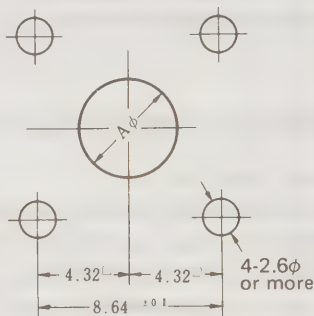
1. When the connector flange is mounted on the outside of the set

(1) When mounted with plain hole

Drawing of mounting



Dimensions of hole drilled in panel



Unit: mm

Parts for mounting

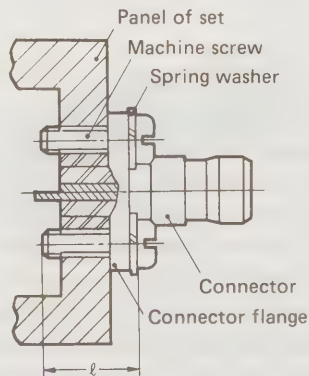
Part name	Type	Length (ℓ)
Machine screw	M2.3 × 0.4 pan-headed small screw or round small screw	t + 4.7mm or more*2
Nut	For M2.3 × 0.4	—
Spring washer	For M2.3	—
Flat washer*1	For M2.3	—

*1 Mount between nut and panel when it is wished to prevent peeling of the panel coating.

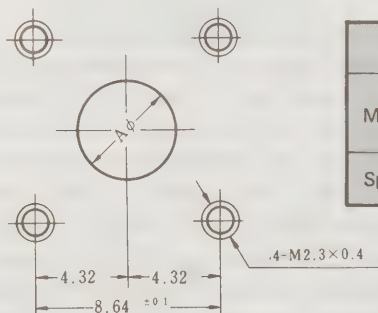
*2 The length will be t + 5.2mm or more when a flat washer is used.

(2) When mounted with tap hole

Drawing of mounting



Dimensions of hole drilled in panel



Unit: mm

Parts for mounting

Parts	Type	Length (ℓ)
Machine screw	M2.3 × 0.4 pan-headed small screw or round small screw	Depends on set design
Spring washer	For M2.3	

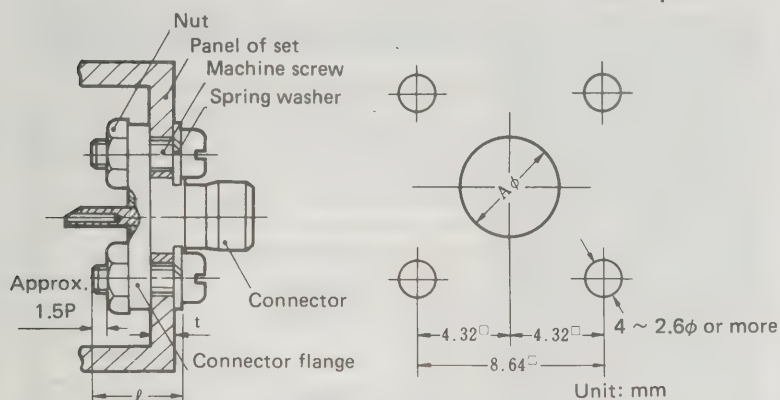
List of Aφ dimensions (common to both (1) and (2))

Aφ (mm)	Applicable products
4.17 or more	POB-R-6, POB-RP-6, POB-LR-5, POB-LRP-5
5.55 or more	POB-PA-JJ HRMJ-POBJ-PA (when the HRM side is on the outside)
6.35 or more	HRMJ-POBJ-PA (when the POB side is on the outside)
7.15 or more	POB-PJ-141, POB-PJ-85
8 or more	POB-PJ-55/U, POB-PJ-58/U
Depends on set design	POB-R-4, POB-RP-4, POB-R-15, POB-RP-15

2. When the connector flange is mounted on the inside of the set

Drawing of mounting

Dimensions of hole drilled in panel



List of maximum panel thicknesses

t (mm)	Applicable products
1.8	POB-PJ-141, POB-PJ-85, POB-PJ-55/U, POB-PJ-58/U, POB-R-4, POB-R-6, POB-R-15
2.0	POB-PA-JJ HRMJ-POBJ-PA (when the HRM side is on the outside)
6.2	HRMJ-POBJ-PA (when the POB side is on the outside)

Parts for mounting

Part name	Type	Length (ℓ)
Machine screw	M2.3 x 0.4 Pan-headed small screw or round small screw	t + 4.7mm or more*2
Nut	For M2.3 x 0.4	—
Spring washer	For M2.3	—
Flat washer*1	For M2.3	—

*1 Mount between flange and panel when it is wished to prevent peeling of the panel coating.

*2 The length will be t + 5.2 mm or more when a flat washer is used.

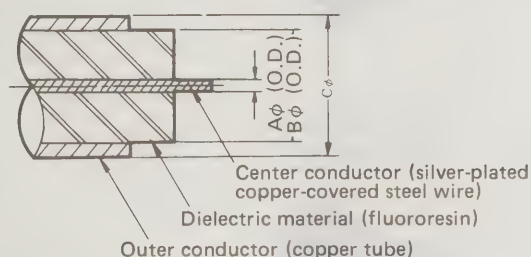
List of Aφ dimensions

Aφ (mm)	Applicable products
5.55 or more	POB-PA-JJ HRMJ-POBJ-PA (when the POB side is on the outside)
6.35 or more	POB-R-4, POB-R-6, POB-R-15, HRMJ-POBJ-PA (when the HRM side is on the outside)
7.65 or more	POB-PJ-141, POB-PJ-85, POB-PJ-55/U, POB-PJ-58/U
Impossible to mount	POB-LR-5, POB-LRP-5, POB-RP-4, POB-RP-6, POB-RP-15

Standard Cables

Following are the dimensions, structures and materials of standard cables for the POB series:

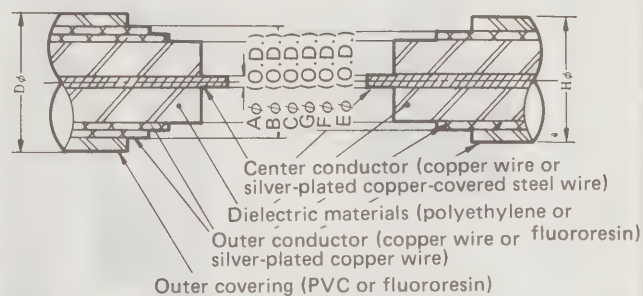
Semi-rigid cables



Cable name	Aφ	Bφ	Cφ
.141-inch semi-rigid cables	0.912φ	2.946φ ^{+0.025} ~3.01φ ^{+0.025}	3.581φ ^{+0.025}
.085-inch semi-rigid cables	0.511φ	1.671φ ^{+0.0025}	2.197φ ^{+0.025}

Unit: mm

Flexible cables



Unit: mm

Cable name	Aφ	Bφ	Cφ	Dφ
*3D-2W (Irrax cable)	0.90φ ^{+0.02}	3.0φ ^{+0.2}	4.4φ	5.6φ ^{+0.3}
RG-142B/U	0.991φ	2.95φ ^{+0.12}	4.34φ	4.95φ ^{+0.12}
RG-55/U	0.813φ	2.95φ ^{+0.12}	4.47φ	5.25φ or less
Cable name	Eφ	Fφ	Gφ	Hφ
RG-58/U	19/0.18φ	2.95φ ^{+0.1}	3.81φ	4.95φ ^{+0.1}

*These are different from the 3D-2W cables in the JIS and NTT specifications.

POB SERIES RF CO-AXIAL CONNECTORS

Connecting tools

Part No.	Overview of tool
POB-T-1	Supporting tool used when soldering L-type plugs
HRM-T-4	Tool for solderless connection of connectors for flexible cables
HRM-T-5	Tool for bending .141-inch semi-rigid cables
HRM-T-6	Positioning tool used when soldering .141-inch semi-rigid cables
HRM-T-8	Positioning tool used when soldering .085-inch semi-rigid cables
HRM-T-9	Tool for bending .085-inch semi-rigid cables

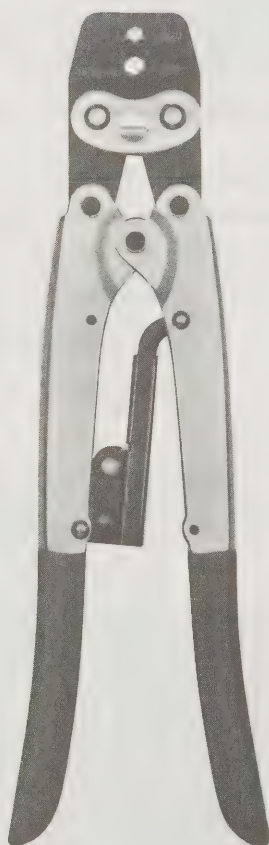
Applicable connectors	Types of cables	Tools used
POB-P-141, POB-J-141 POB-PJ-141	.141-inch semi-rigid cables	HRM-T-5, T-6
POB-LP-141	.141-inch semi-rigid cables	POB-T-1 HRM-T-5
POB-P-85, POB-J-85 POB-PJ-85	.085-inch semi-rigid cables	HRM-T-8, T-9
POB-LP-85	.085-inch semi-rigid cables	POB-T-1 HRM-T-9
POB-P-55/U, POB-J-55/U POB-PJ-55/U	3D-2W (Irrax cables) RG-142B/U, RG-55/U	HRM-T-4*1
POB-P-58/U, POB-J-58/U POB-PJ-58/U	RG-58/U	HRM-T-4*2
POB-LP-55/U	3D-2W (Irrax cables) RG-142B/U, RG-55/U	POB-T-1 HRM-T-4*1
POB-LP-58/U	RG-58/U	POB-T-1 HRM-T-4*2

*1 Make crimp connections with the larger hexagonal hole of HRM-T-4.

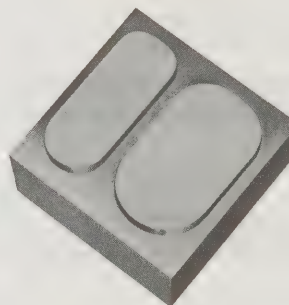
*2 Make crimp connections with the smaller hexagonal hole of HRM-T-4.



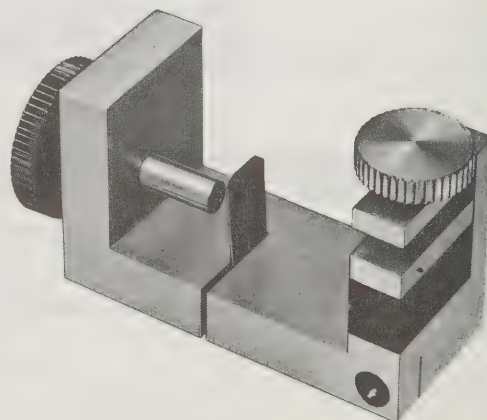
HRM-T-4
Crimp tool



HRM-T-5, T-9
Cable bending tools



HRM-T-6, T-8
Soldering tools



POB SERIES RF CO-AXIAL CONNECTORS

Connecting Methods

1. POB-P-141, POB-J-141, POB-PJ-141, POB-P-85, POB-J-85, POB-PJ-85

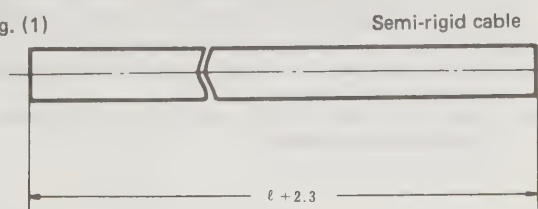
(1) Cut cable.

When cutting semi-rigid cables, cut them at the actually needed length ℓ plus 2.3mm.

Note 1: Take care that the cut surface is vertical.

Note 2: Length ℓ should be the length of the outer conductor of the cable after the wiring has been completely connected.

Fig. (1)



(2) Fasten the cable to the shell by soldering.

(Use HRM-T-6 or T-8.)

i) Fasten ① in Fig. (2) with a vice.

ii) As shown in the figure, pass the tightening fixture through the cable, and fasten the cable by tightening ③.

iii) Next, tighten ② so that the cable tip protrudes 2.3mm from the tip of the shell.

iv) Fasten the tightening fixture by soldering it to the cable.

Note 1: It is desirable to use at this time a soldering iron of about 80W.

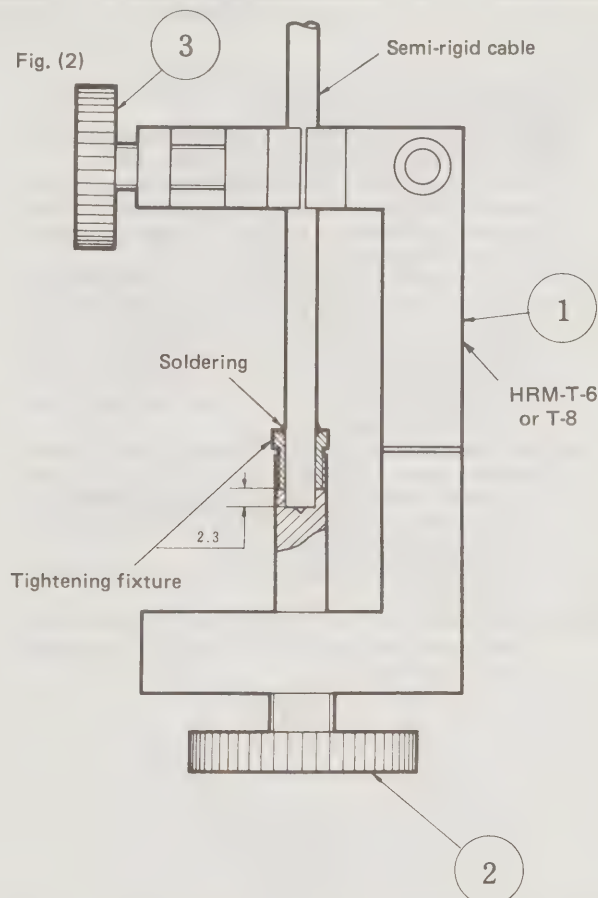
Note 2: The solder must be applied evenly on the circumference.

Note 3: During soldering, be careful not to allow the tip of the tightening fixture to move away from ②.

Note 4: Screw ③ must be tightened tightly so that the cable will not move as a result of the thermal stress generated by the soldering.

Note 5: Polish the soldering part of the cable in advance with sandpaper or the like so that the solder will adhere easily to it.

Fig. (2)

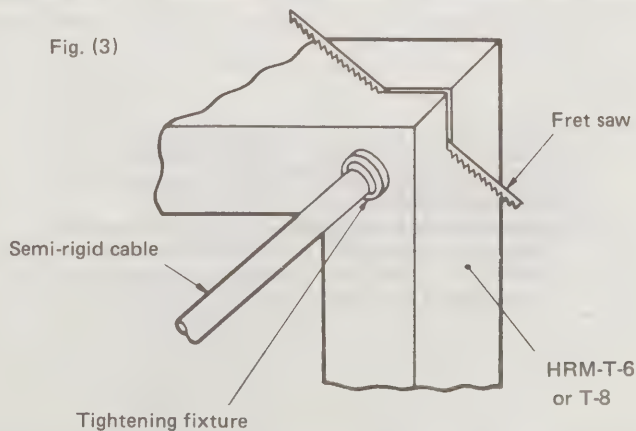


(3) Cut off the outer conductor of the cable with a fret saw at the tip position of the tightening fixture. (Refer to Fig. (3).)

Note 1: Be careful not to damage the tip of the tightening fixture when cutting the cable, and be sure that the tip of the tightening fixture and the cut surface of the cable will be on the same surface.

Note 2: The slit with a width of 0.4 on the tool is provided so that the fret saw will stop between the center conductor and outer conductor of the cable. Care is necessary because if the tool is damaged during cutting the depth of the slit will change, and consequently the center conductor of the cable will be damaged.

Fig. (3)

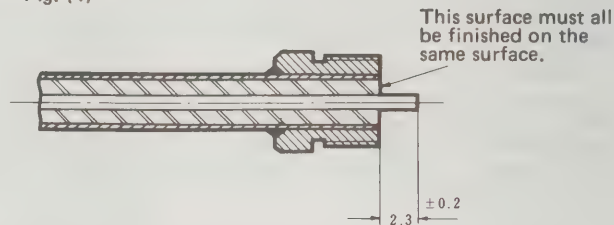


- (4) Cut the cable insulation vertically at the tip of the tightening fixture (using a razor) and remove it. (Refer to Fig. (4))

Note 1: Finish so that the tips will also be on the same surface.

Note 2: Be careful that the center conductor of the cable is not bent or damaged.

Fig. (4)



- (5) Solder the contact to the center conductor of the cable. (Refer to Fig. (5), Fig. (6))

- i) Put the positioning plate of the center conductor ① into the groove of the HRM-T-6 or T-8 proper.
- ii) Mount the block in Fig. (4) onto HRM-T-6 or T-8, as shown in Fig. (5). The tip will strike against ①. Pass the center conductor of the cable through the groove of ①, and fasten at that position.
- iii) Fit the contact of the connector into the contact holder ③. Perform preliminary soldering and insert as shown in Fig. (5) from the horizontal hole in the HRM-T-6 or T-8 proper ④. Align the center conductor of the cable with the female contact hole while heating the contact with the soldering iron, and press it until it strikes against ①.

- iv) After the soldering is finished, remove ① and remove the block from the HRM-T-6 or T-8 proper ④ and the contact holder ③. Finish the place which was soldered with a razor or the like uniformly on the circumference. (Refer to Fig. (6))

Note 1: It is desirable to use a soldering iron of about 20 ~ 30W.

Note 2: Be careful that extra solder does not flow onto the center conductor of the cable at the part $0.4^{+0}_{-0.04}$ in Fig. (6).

Fig. (5)

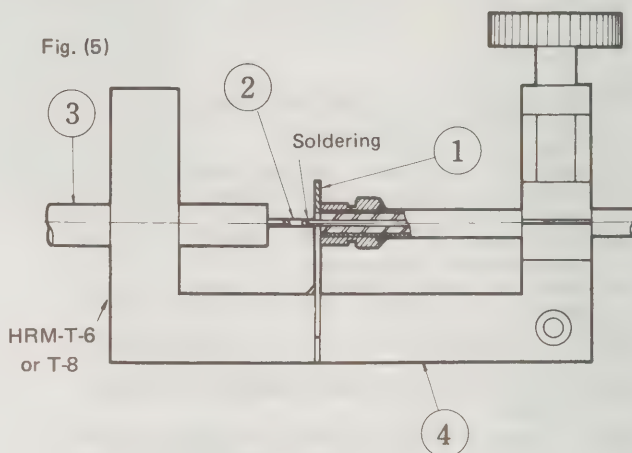
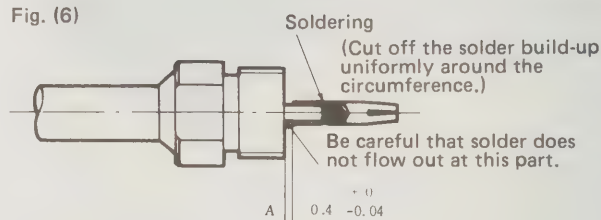


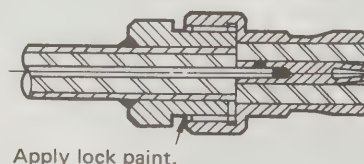
Fig. (6)



- (6) Screw the block into the connector proper. Connection of the wiring will be completed as in Fig. (7) when the block in Fig. (6) is screwed into the connector proper.

Note 1: The screw must be tightened with a torque of 30kg-cm or more. When it is especially necessary to prevent the screw from loosening, lock paint is to be applied as is shown in the figure.

Fig. (7)



POB SERIES RF CO-AXIAL CONNECTORS

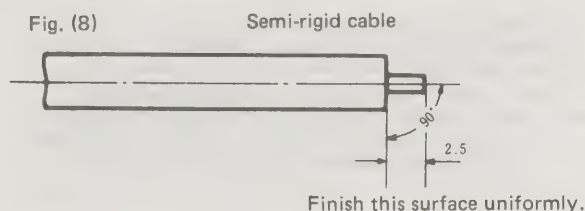
2. POB-LP-141, POB-LP-85

(1) Process cable ends. (Refer to Fig. (8))

Let the center conductor of the cable protrude 2.5mm and remove the outer conductor and insulation.

Note 1: Finish the outer conductor and insulation vertically and uniformly with a fret saw or the like.

Note 2: When cutting, be careful not to damage the center conductor.



(2) Solder the center conductor of the cable to the male contact of the connector. (Refer to Fig. (9))

i) Fit POB-T-1 and hold it firmly in place with a vice.

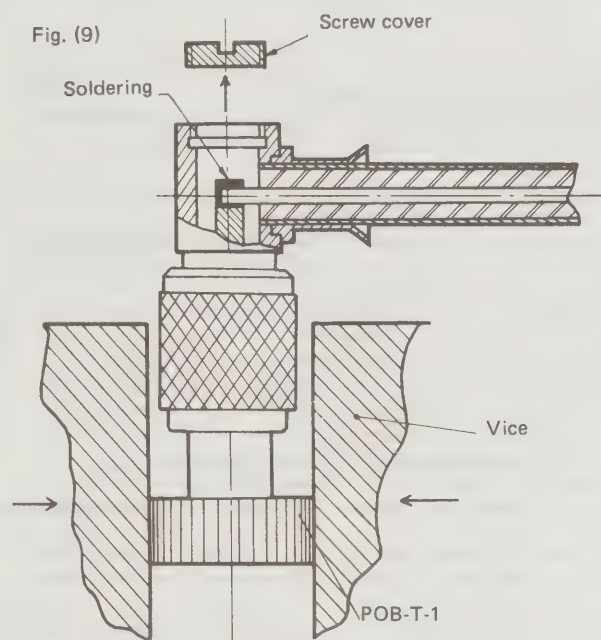
ii) Remove the screw cover, insert the cable after end processing as shown in Fig. (8) through the cord inlet, and solder it as shown in Fig. (9).

Note 1: Insert the cable until the tip of the outer conductor comes into contact with the inner surface of the connector shell, as shown in Fig. (9). Insert the center conductor into the groove of the male contact of the connector, and solder it.

Note 2: When soldering, be careful not to apply solder to the center conductor of the cable or to the outer surface of the female contact of the connector.

Note 3: It is desirable to use a soldering iron of about 20 ~ 30W. Its tip must be narrowed so as to make the work easy.

Note 4: When soldering, be careful to avoid knobby soldering. (To check this point, rotate the cable after soldering.)



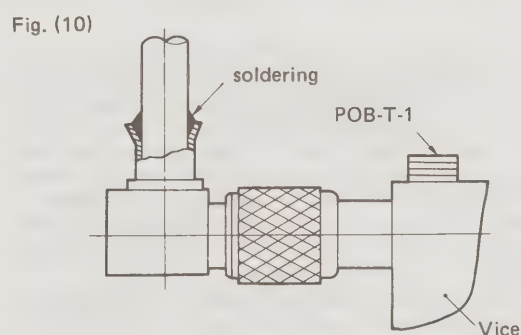
(3) Solder the outer conductor.

Fit POB-T-1 into the opening part as shown in Fig. (10), hold it in a vice, and solder the outer conductor of the cable and the connector shell.

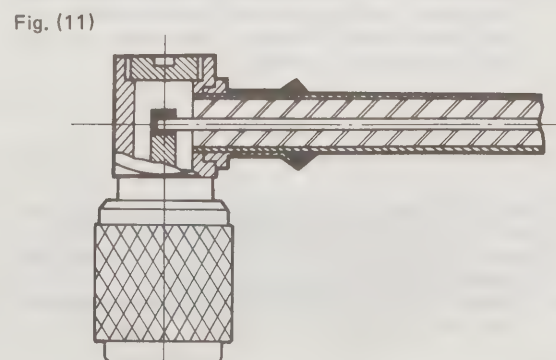
Note 1: It is desirable to use a soldering iron of about 80W.

Note 2: Apply the solder uniformly on the circumference, and carry out the soldering as speedily as possible.

Note 3: Polish the soldered part of the cable in advance with sandpaper or the like so that the solder will adhere easily to it.



(3) Remove POB-T-1 and screw in the screw cover. Then the connections of the wiring will be completed as shown in Fig. (11).



3. POB-P-55/U, POB-P-58/U

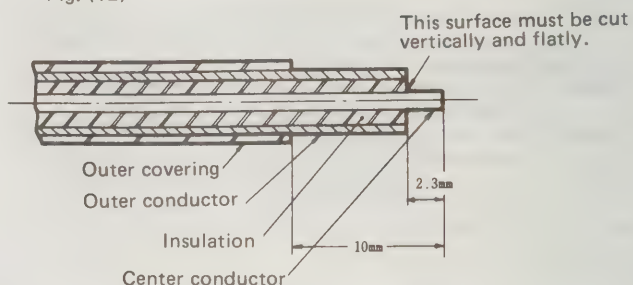
(1) Process cable ends (Refer to Fig. (12))

- i) Cut off 10mm of the outer covering of the cable. Next cut off the outer conductor and insulation so that 2.3mm of the center conductor will protrude.

Note 1: When cutting the outer covering and insulation, be careful not to damage the outer conductor and the center conductor.

Note 2: Be sure to cut the cable insulation vertically and flatly.

Fig. (12)



(2) Solder the center conductor

Hold the male contact in place with a vice as shown in Fig. (13) and solder it to the center conductor of the cable.

Note 1: Before soldering, apply preliminary solder on the male contact in advance.

Note 2: It is a good idea to make a hole of 0.8ϕ , as shown in Fig. (13), at the part where the male contact is to be held in the vice.

Note 3: Be careful to perform the soldering speedily so that the tip of the cable insulation will not dissolve as a result of the heat during soldering.

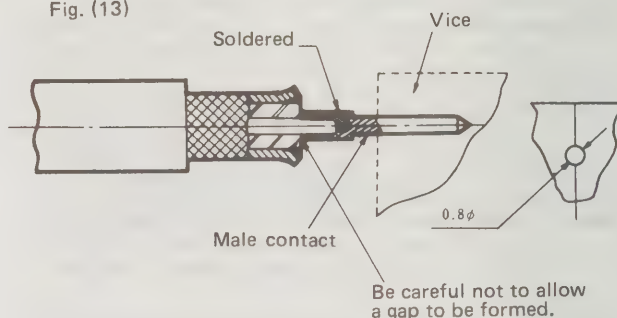
Note 4: The build-up of solder after soldering must be finished uniformly on the circumference. To check the strength of the soldering, pull the male contact with a force of about 1kg.

Note 5: Be careful not to allow gaps to be produced between the insulation and the contact after soldering.

Note 6: Be careful not to allow the male contact to be soldered in a bent position towards the center conductor of the cable.

Note 7: It is desirable to use a soldering iron of about 20 ~ 30W.

Fig. (13)



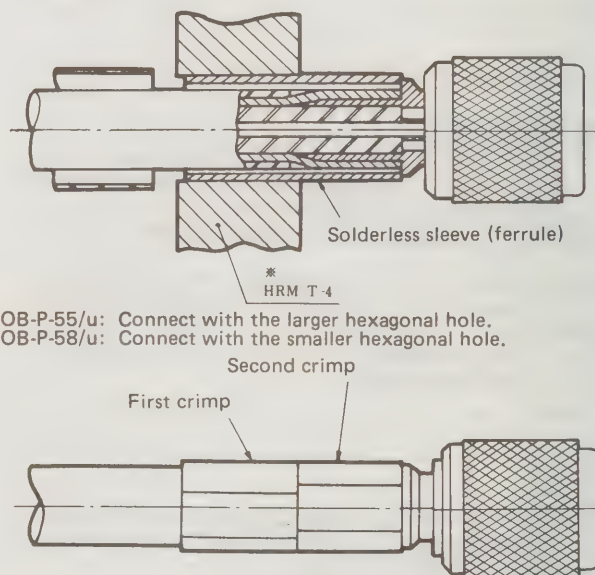
(3) After passing the boot and ferrule (sleeve) over the cable, insert the cable through the connector shell cord inlet, and crimp the ferrule (sleeve) in a hexagonal shape with HRM-T-4. (Refer to Fig. (14))

- i) To insert the cable, align the male contact with the hole in the insulation, and insert the connector shell between the cable insulation and the outer conductor.

- ii) Insert the ferrule (sleeve) until it strikes against the uneven part of the shell, as shown in Fig. (14), and crimp it in a hexagonal shape with HRM-T-4.

Note 1: Insertion of the cable is finished when the uneven part of the male contact strikes against the connector insulation. Crimping of the ferrule (sleeve) is performed first on the cable side and next on the connector side. (Be careful about the order; if the wrong order is followed, the clamping force will be reduced by one half.)

Fig. (14)

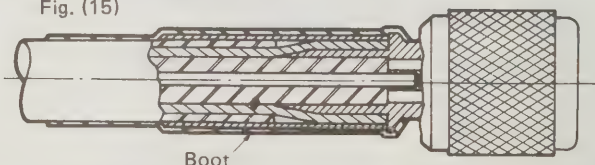


* POB-P-55/u: Connect with the larger hexagonal hole.
POB-P-58/u: Connect with the smaller hexagonal hole.

(4) Put on the boot over the solderless sleeve, and apply heat with a hair dryer or the like to cause shrinking. When the connection of the wiring is completed, the appearance will be as shown in Fig. (15).

Note 1: When shrinking, catch the boot on the groove in the shell, as shown in Fig. (15).

Fig. (15)



POB SERIES RF CO-AXIAL CONNECTORS

4. POB-J-55/U, POB-PJ-55/U, POB-J-58/U, POB-PJ-58/U

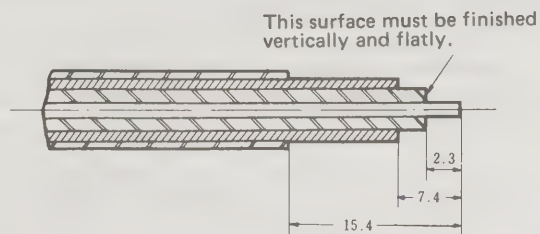
(1) Process the cable ends

- i) Cut off 15.4mm of the outer covering of the cable. Next cut off 7.4mm of the outer conductor, and also cut off 2.3mm of the insulation.

Note 1: When cutting the outer covering and insulation, be careful not to damage the outer conductor and the center conductor.

Note 2: Cut the cable insulation vertically and flatly.

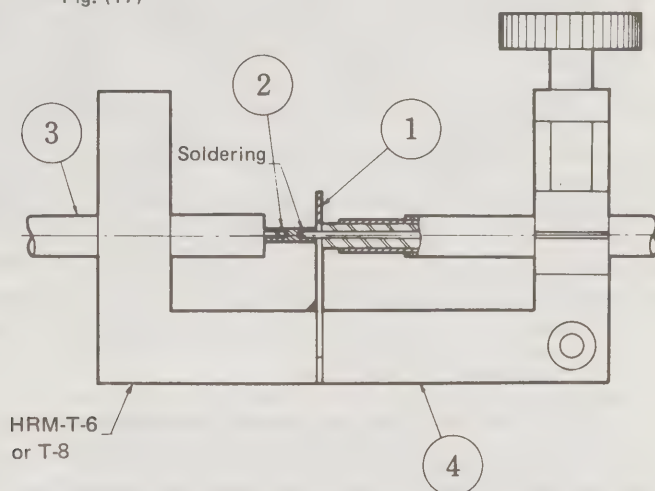
Fig. (16)



(2) Solder the center conductor.

Using HRM-T-6 or T-8, solder the center conductor by the same procedure as in POB-J-141. (Refer to Fig. (17))

Fig. (17)



- (3) After passing the boot and ferrule (sleeve) over the cable, insert the cable through the connector-shell cord inlet, and crimp the ferrule (sleeve) in a hexagonal shape with HRM-T-4. (Refer to Fig. (17))

- i) To insert the cable, align the female contact with the hole in the insulation, and insert the connector shell between the insulation of the cable and the outer conductor.

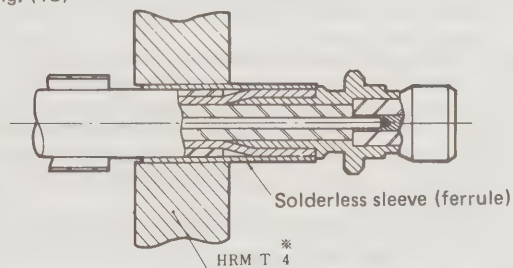
- ii) Insert the ferrule (sleeve) until it strikes against the uneven part of the shell, as shown in Fig. (18), and crimp it in a hexagonal shape with HRM-T-4.

Note 1: Spread out the tip in order to make it easy to insert the outer conductor of the cable.

Note 2: Insertion of the cable is finished when the cable insulation strikes against the connector insulation.

Note 3: Crimping of the ferrule (sleeve) is performed first on the cable side and next on the connector side. (Be careful about the order; if the wrong order is followed, the clamping force will be reduced by one half.)

Fig. (18)

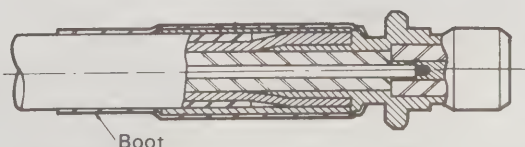


※ POB-P-55/u: Connect with the larger hexagonal hole.
POB-P-58/u: Connect with the smaller hexagonal hole.

- (4) Put on the boot over the ferrule (sleeve), and apply heat with a hair dryer or the like to cause shrinking. When the connection of the wiring is completed, the appearance will be as shown in Fig. (19).

Note 1: When shrinking, catch the boot on the groove in the shell.

Fig. (19)



5. POB-LP-55/U, POB-LP-58/U

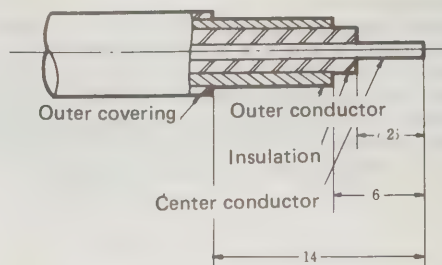
(1) Process the cable ends

Process the cable ends as shown in Fig. (20).

Note 1: When cutting the outer covering and insulation, be careful not to damage the outer conductor and the center conductor.

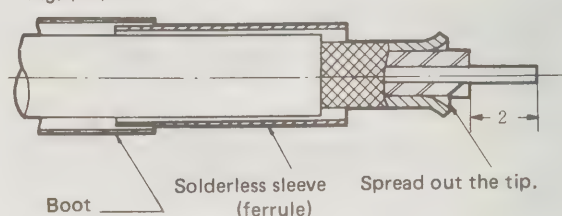
Note 2: Cut the insulation vertically and flatly.

Fig. (20)



(2) Pass the boot and ferrule (sleeve) over the cable and spread out the tip of the outer conductor. (Refer to Fig. (21))

Fig. (21)



(3) Solder the center conductor and crimp the ferrule (sleeve).

- i) Fit POB-T-1 and hold it firmly in place with a vice.
- ii) Remove the connector screw cover and insert the cable through the cord inlet, as shown in Fig. (22), aligning the center conductor of the cable with the groove at the connector male contact.
- iii) Solder the center conductor of the cable to the male contact at the position where the cable insulation strikes against the male contact.
- iv) After the soldering, check to make sure whether or not it has been carried out perfectly by pulling the cable with a force of about 1 kg of weight. Next insert the ferrule (sleeve) over the outer conductor of the cable until it strikes against the uneven part of the shell, and crimp it in a hexagonal shape with HRM-T-4.

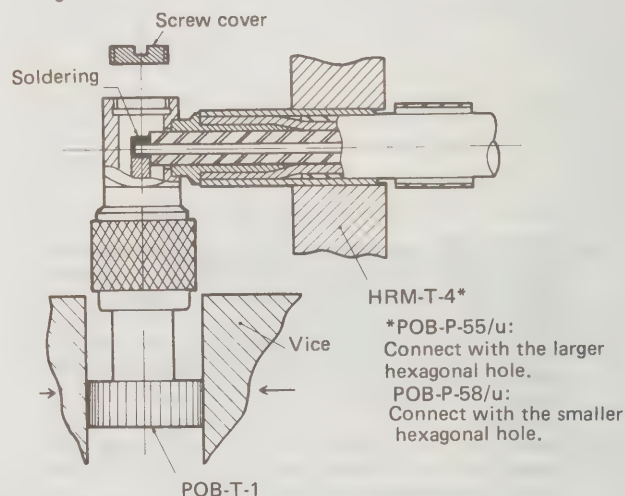
Note 1: Perform the soldering carefully, making sure not to deposit solder on the outer surface of the male end of the connector.

Note 2: It is desirable to use a soldering iron of about 20 ~ 30W. Its tip must be narrowed for easy access.

Note 3: Soils on the inside of the connector produced as a result of soldering should be washed off with thinner or the like in order to prevent the occurrence of faulty insulation or inadequate withstand voltage.

Note 4: Crimping of the ferrule (sleeve) is performed first on the cable side and next on the connector side. (Be careful about the order; if the wrong order is followed, the clamping force will be reduced by one half.)

Fig. (22)



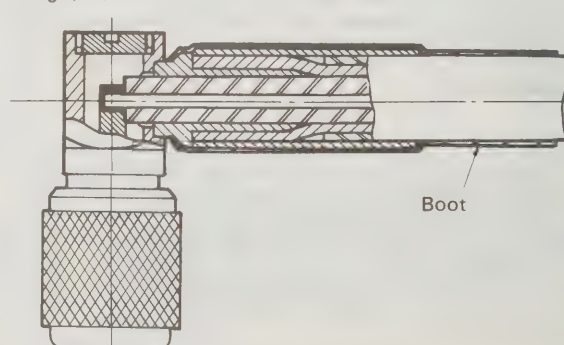
(4) Put on the boot over the ferrule (sleeve), and apply heat with a hair dryer or the like to cause shrinking. Then remove POB-T-1 from the opening part and tighten the screw cover.

When the connection of the wiring is completed, the appearance will be as shown in Fig. (23).

Note 1: When shrinking, catch the boot on the groove in the shell, as shown in Fig. (23).

Note 2: Remove POB-T-1 after shrinkage of the boot.

Fig. (23)

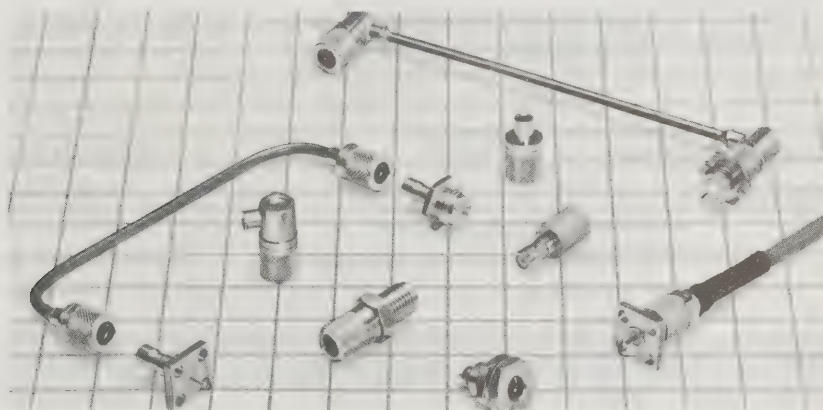


POD SERIES RF CO-AXIAL CONNECTORS

Overview

The POD (Push-on Lock Connectors Type D) series consists of highly compatible, ultrasmall-size push-on lock-type coaxial connectors for 50Ω system ultrathin coaxial cables.

The POD series is suitable for high-density in-unit wiring for the microwave band and high-speed pulse transmission. They make it possible to speed up adjustment and maintenance of the devices and also increase the overall cost-effectiveness.



Uses

The POD series is suitable for in-unit wiring in electronic measuring instruments, wired and wireless communications equipment, broadcasting equipment, etc. and for connections between units.

Characteristic features

1. Good performance characteristics for ultrasmall-size units

- (1) As connectors for the microwave band, the size has been reduced by about 70% in comparison with the familiar HRM connectors, and also the usable frequency band is wide (up to 8GHz).
- (2) The coupling parts have spring mechanism parts which are able to withstand twisting well. Therefore, their stability and reliability are as high as those of connectors of the screw-in type.

2. Mounting and removal are easy.

- (1) Time is not required in mounting and removal, which can be performed almost instantaneously. Secure connections can be confirmed by the lock sounds.
- (2) Since mounting and removal can be performed with the fingers, there is no need to provide tools such as spanners or torque wrenches.

3. Connectors match ultrathin coaxial cables.

- (1) They fit in with the recent trend towards more-compact line parts and are most suitable as end connectors for .085-inch semi-rigid cables, which are widespread use.
- (2) They match ultrathin flexible cables such as 1.5D-2V or 2.5D-2V.

Standard cables

Table 1 lists the standard cables of the POD series.

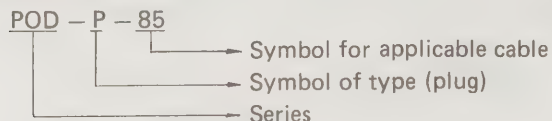
Table 1

Classification	Cable name	Cable symbol
Flexible cables	1.5D-2V	1.5DV
	1.5D-2W	1.5DW
	2.5D-2V	2.5DV
Semi-rigid cables	.085-inch semi-rigid cables	85

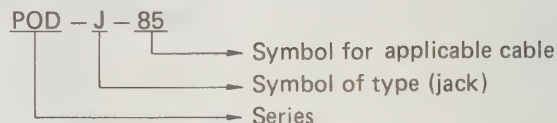
Configuration of Part Numbers

The part numbers of the POD series have the following configuration:

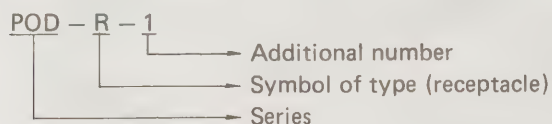
Example 1. Plugs



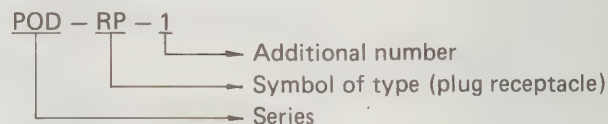
Example 2. Jacks



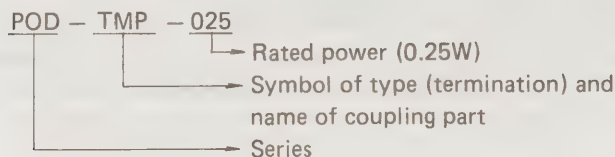
Example 3. Receptacles



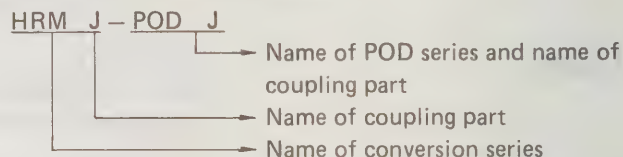
Example 4. Plug receptacles



Example 5. Terminations



Example 6. Conversion adapters



(1) Name of series

POD is used as the name of the series.

(2) Symbol of type

The types of the connectors are as shown in Table 2.

Table 2

Mode of connector	Type of connector	Symbol of type
Plug	Straight plug	P
	L-type plug	LP
Jack	Straight jack	J
	L-type jack	LJ
Receptacle	Straight receptacle	R
Plug receptacle	Straight plug receptacle	RP
In-series adapter	Straight adapter	A
Termination	Plug termination	TMP
	Jack termination	TMJ

Materials, finish

Part name	Materials		Finish
	Materials	Applicable standards	Plating
Shell	Brass	JIS H 3250	Nickel plating
Outer cylinder	Brass	JIS H 3250	Nickel plating
Female center contact	Beryllium copper	JIS H 3270	Gold plating
Male center contact	Brass	JIS H 3250	Gold plating
Solderless sleeve (ferrule)	Annealed copper	JIS H 3250	Nickel plating
Insulation	Tetrafluoride resin		
Cord covering (jacket)	Cross-linked polyolefin		

(3) Symbols of applicable cables

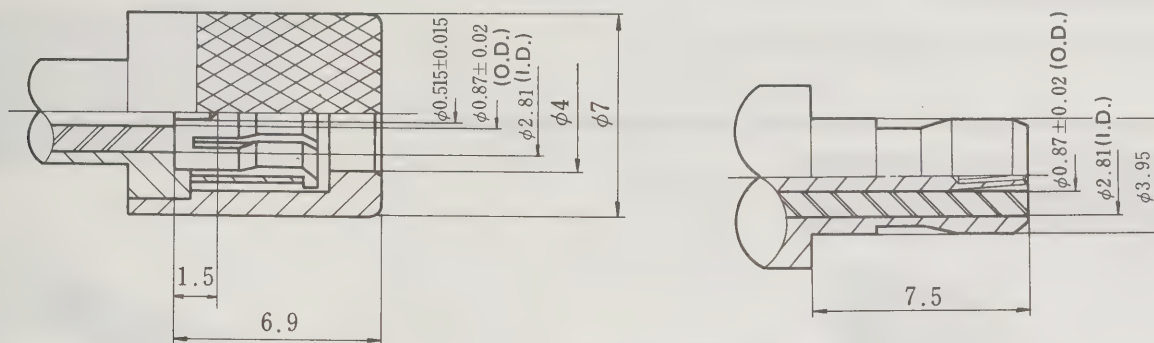
Refer to the standard cables in Table 1.

(4) Additional numbers

Additional numbers are assigned in sequence as there are changes in types, such as the parts where the wiring is connected.

POD SERIES RF CO-AXIAL CONNECTORS

Coupling part



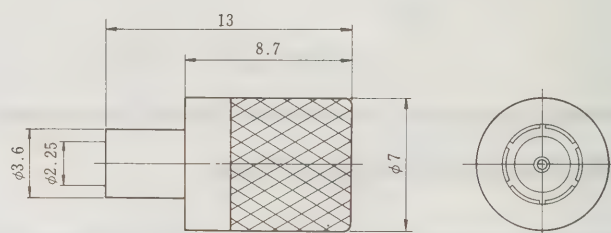
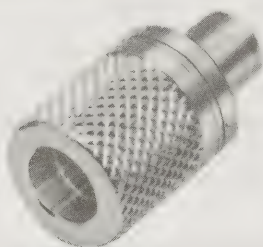
Performance properties

Items		Performance properties																																										
Structure, Dimensions	Structure	Refer to individual drawings																																										
	Dimensions	Dimensions of coupling parts: see p. 115. External dimensions: see p.116 ~ 119.																																										
Electrical Properties	Insulation resistance	1000MΩ or more measured at 500V DC																																										
	Withstand voltage	Test voltage 500V AC (rms) (at normal pressure)																																										
	Contact resistance	5mΩ or less at both center contact and outer contact																																										
	Characteristic impedance	50 Ω																																										
	Frequency range	DC ~ 8GHz																																										
	Voltage standing wave ratio (V.S.W.R.)	<table><tr><td>Connectors for .085-inch semi-rigid cables</td><td><table><tr><td>Straight type</td><td>DC ~ 8GHz</td><td>1.2 or less</td></tr><tr><td>L type</td><td>DC ~ 8GHz</td><td>1.25 or less</td></tr></table></td><td></td><td></td></tr><tr><td>Connectors for flexible cables</td><td><table><tr><td>Straight type</td><td>DC ~ 4GHz</td><td>1.2 or less</td></tr><tr><td>L type</td><td>DC ~ 2GHz</td><td>1.2 or less</td></tr></table></td><td></td><td></td></tr><tr><td>Receptacles</td><td>Straight type</td><td>DC ~ 8GHz</td><td>1.2 or less</td><td></td></tr><tr><td>Adapters</td><td><table><tr><td>Straight type</td><td>DC ~ 8GHz</td><td>1.2 or less</td></tr><tr><td>For HRM</td><td>DC ~ 8GHz</td><td>1.2 or less</td></tr></table></td><td></td><td></td></tr><tr><td>Terminations</td><td>Straight type</td><td>DC ~ 8GHz</td><td>1.2 or less</td><td></td></tr></table>				Connectors for .085-inch semi-rigid cables	<table><tr><td>Straight type</td><td>DC ~ 8GHz</td><td>1.2 or less</td></tr><tr><td>L type</td><td>DC ~ 8GHz</td><td>1.25 or less</td></tr></table>	Straight type	DC ~ 8GHz	1.2 or less	L type	DC ~ 8GHz	1.25 or less			Connectors for flexible cables	<table><tr><td>Straight type</td><td>DC ~ 4GHz</td><td>1.2 or less</td></tr><tr><td>L type</td><td>DC ~ 2GHz</td><td>1.2 or less</td></tr></table>	Straight type	DC ~ 4GHz	1.2 or less	L type	DC ~ 2GHz	1.2 or less			Receptacles	Straight type	DC ~ 8GHz	1.2 or less		Adapters	<table><tr><td>Straight type</td><td>DC ~ 8GHz</td><td>1.2 or less</td></tr><tr><td>For HRM</td><td>DC ~ 8GHz</td><td>1.2 or less</td></tr></table>	Straight type	DC ~ 8GHz	1.2 or less	For HRM	DC ~ 8GHz	1.2 or less			Terminations	Straight type	DC ~ 8GHz	1.2 or less
Connectors for .085-inch semi-rigid cables	<table><tr><td>Straight type</td><td>DC ~ 8GHz</td><td>1.2 or less</td></tr><tr><td>L type</td><td>DC ~ 8GHz</td><td>1.25 or less</td></tr></table>	Straight type	DC ~ 8GHz	1.2 or less	L type	DC ~ 8GHz	1.25 or less																																					
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Straight type	DC ~ 8GHz	1.2 or less																																										
For HRM	DC ~ 8GHz	1.2 or less																																										
Terminations	Straight type	DC ~ 8GHz	1.2 or less																																									
Mechanical Properties	Coupling force (withdrawing force)	1 ~ 5 kg																																										
	Coupling torque	100g-cm or more																																										
	Center contact holding force	50g or more with steel pin gages of $\phi 0.49^{+0}_{-0.005}$																																										
	Service life	500 times																																										
Environmental Properties	Vibration resistance	There must be no abnormalities when tested by the method of JIS C5025, testing method I, Type B.																																										
	Impact resistance	There must be no abnormalities when tested by the method of JIS C5026, test conditions A.																																										
	Humidity resistance	There must be no abnormalities when tested by the method of JIS C5024, testing method I.																																										
	Corrosion resistance	There must be no abnormalities when tested by the method of JIS C5028.																																										

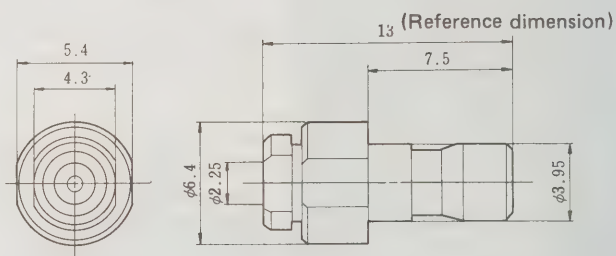
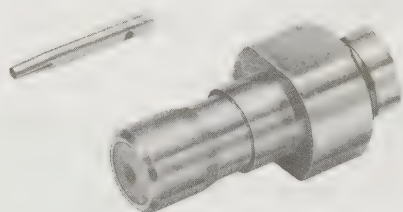
Guide to products

The following are the typical products of the POD series:

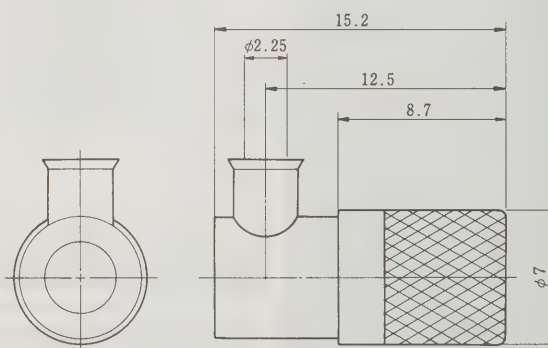
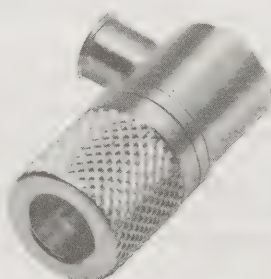
Part No.	Applicable cable
POD-P-85	.085-inch semi-rigid cables



Part No.	Applicable cable
POD-J-85	.085-inch semi-rigid cables



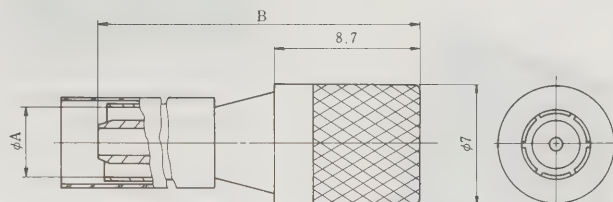
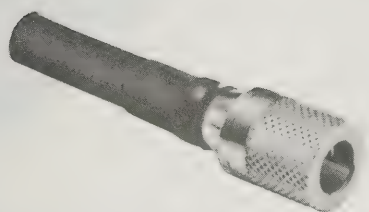
Part No.	Applicable cable
POD-LP-85	.085-inch semi-rigid cables



POD SERIES RF CO-AXIAL CONNECTORS

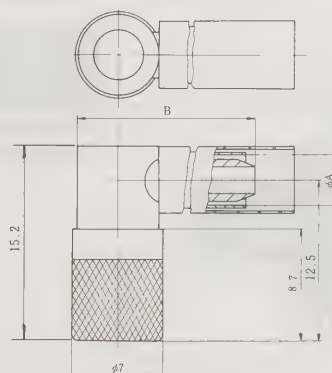
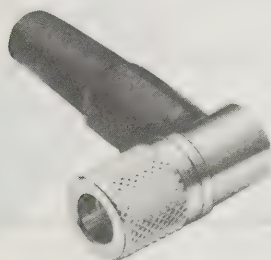
Connectors for flexible cables

Part No.	Applicable cable
POD-P-1.5DV	1.5D-2V
POD-P-1.5DW	1.5D-2W
POD-P-2.5DV	2.5D-2V



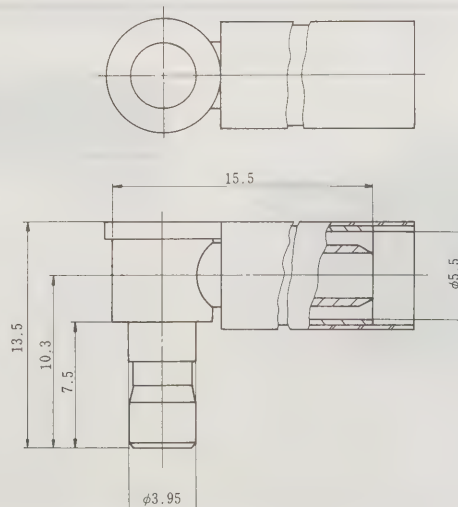
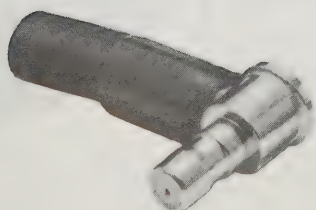
Part No.	φA	B
POD-P-1.5DV	2.5	17.8
POD-P-1.5DW	4.1	17.8
POD-P-2.5DV	5.5	19.8

Part No.	Applicable cable
POD-LP-1.5DV	1.5D-2V
POD-LP-1.5DW	1.5D-2W
POD-LP-2.5DV	2.5D-2V

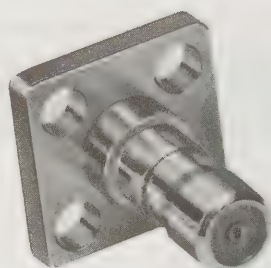


Part No.	φA	B
POD-LP-1.5DV	2.5	13.7
POD-LP-1.5DW	4.1	13.7
POD-LP-2.5DV	5.5	15.9

Part No.	Applicable cable
POD-LJ-2.5V	2.5D-2V

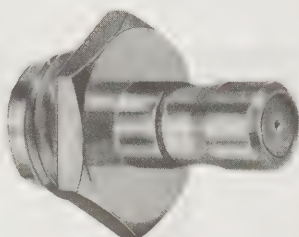
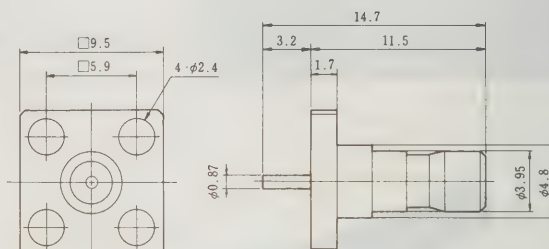


Receptacles



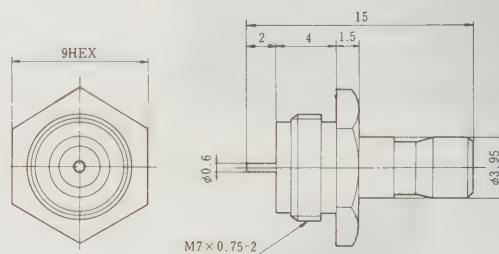
Part No.
POD-R-1

Fastened with machine screws at four places
Round-bar terminals

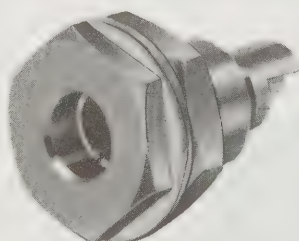


Part No.
POD-R-101

Embedded type
Round-bar terminals

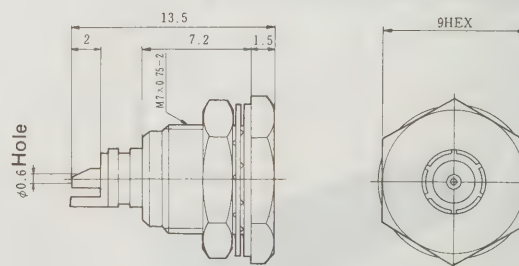


Plug receptacle



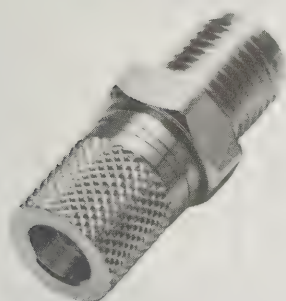
Part No.
POD-RP

Embedded type
Solder pot



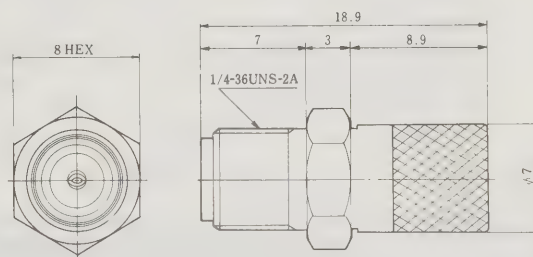
POD SERIES RF CO-AXIAL CONNECTORS

Conversion adapter

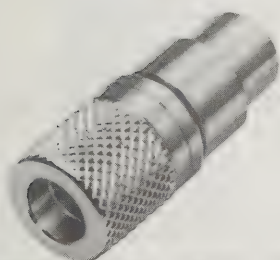


Part No.
HRMJ-PODP

POD series: Male
HRM series: Female

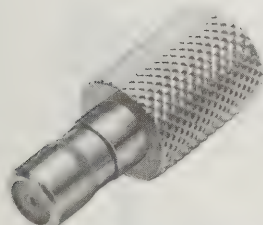
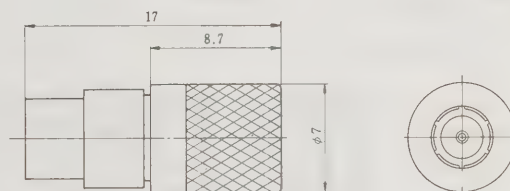


Accessories



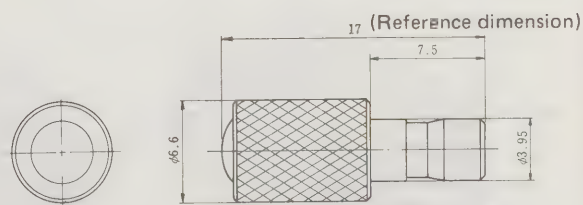
Part No.
POD-TMP-025

Male coupling part terminations



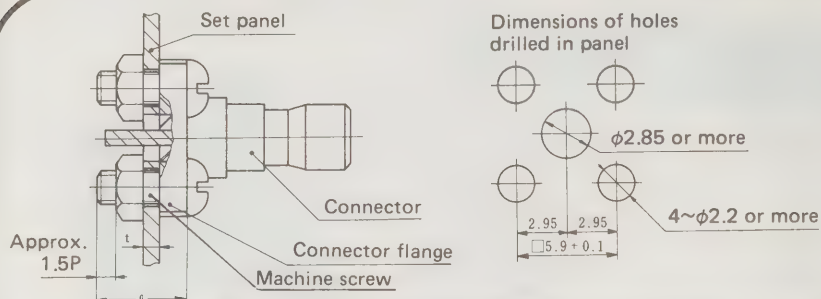
Part No.
POD-TMJ-025

Female coupling part terminations

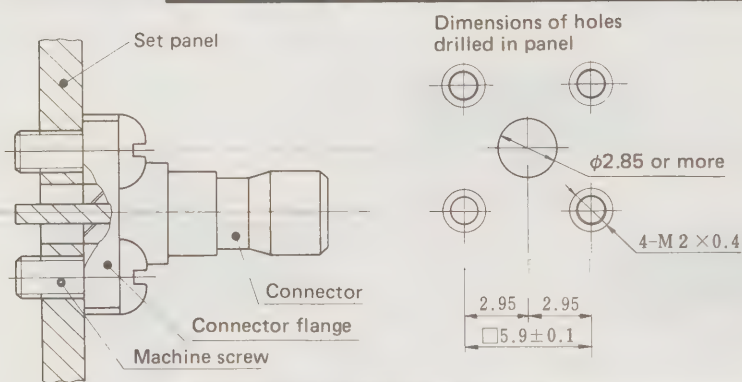


Technical Guidance

(1) Type fastened with four holes

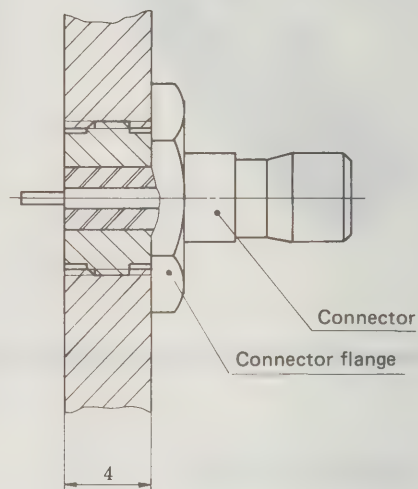


Part name	Type	Length (ℓ)
Machine screw	M2x0.4 Pan-headed small or round small screws	$t + 3.9$ mm or more
Nut	M2 x 0.4	

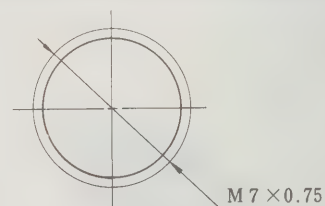


Part name	Type	Length (ℓ)
Machine screw	M2x0.4 Pan-headed small or round small screws	Depends on set design

(2) Embedded type

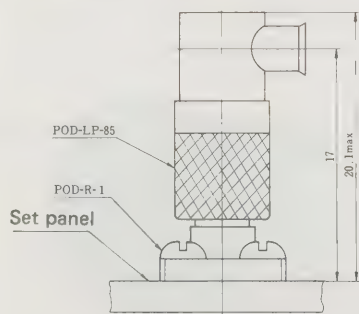


Dimension of hole drilled in panel

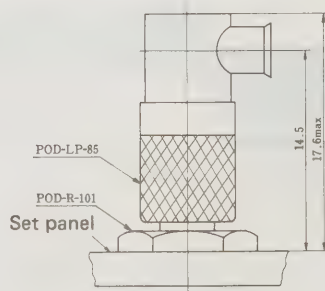


Space factors in connector mounting

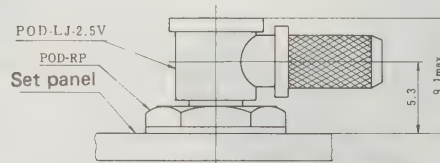
(3) The following space factors are needed when the connectors are mounted with various combinations:



Part No.
POD-LP-85
POD-R-1



Part No.
POD-LP-85
POD-R-101

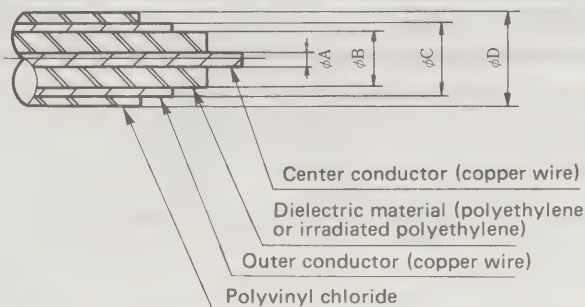
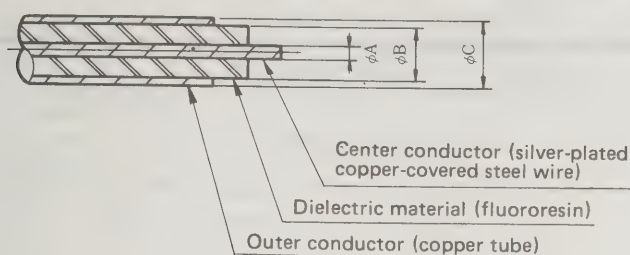


Part No.
POD-RP
POD-LJ-2.5V

POD SERIES RF CO-AXIAL CONNECTORS

Standard cables

The following are the dimensions, structures and materials of the standard cables for the POD series:



Unit: mm

Cable name	ϕA (Outer diameter)	ϕB (Outer diameter)	ϕC
.085-inch semi-rigid cables	0.511	1.671±0.025	2.197±0.025

Cable name	ϕA (Outer diameter)	ϕB (Outer diameter)	ϕC (Outer diameter)	ϕD
1.5D-2V	(7/0.18) 0.54	1.6	2.1	2.9±0.4
1.5D-2W	0.54	1.64	2.64	3.5±0.2
2.5D-2V	0.8	2.7	3.3	4.3±0.5

Connecting fixtures and tools

Fixtures and tools part no.	Overview of tools
POD-T-1	Supporting tool used when soldering L-type plugs
POD-T-2	Positioning tool used when soldering .085-inch semi-rigid cables
UM.MSS-T-1	Tool for crimp connection of connectors for flexible cables
HRM-T-9	Tool for bending .085-inch semi-rigid cables
MSS.UM (1.5)-T	Tool for solderless connection of connectors for flexible cables

Part No.	Types of cables	Tools used
POD-P-85 POD-J-85	.085-inch semi-rigid cables	POD-T-2
POD-LP-85	.085-inch semi-rigid cables	POD-T-1
POD-P-1.5DV	1.5D-2V	UM.MSS-T-1* ¹
POD-P-1.5DW	1.5D-2W	MSS.UM(1.5)-T
POD-P-2.5DV POD-LJ-2.5V	2.5D-2V	UM.MSS-T-1* ²
POD-LP-1.5DV	1.5D-2V	UM.MSS-T-1* ¹ POD-T-1
POD-LP-1.5DW	1.5D-2W	MSS.UM(1.5)-T POD-T-1
POD-LP-2.5DV	2.5D-2V	UM.MSS-T-1* ² POD-T-1

*¹ Perform crimp connections with the hexagonal hole of UM.MSS-T-1 indicated as 1.5.

*² Perform crimp connections with the hexagonal hole of UM.MSS-T-1 indicated as 2.5.

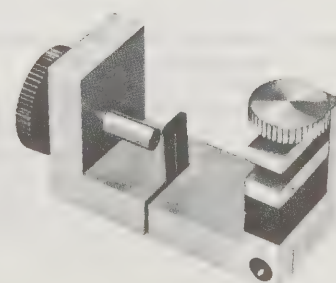
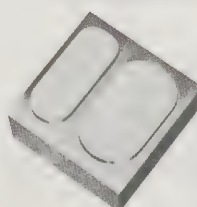
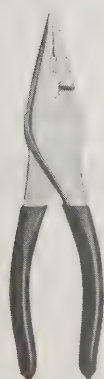
MSS.UM(1.5)-T
Solderless tool

UM.MSS-T-1
Crimp tool

POD-T-1
Supporting tool

HRM-T-9
Cable bending tool

POD-T-2
Soldering tool



Wiring methods

1. POD-P-85

Process 1. Cutting the cable (refer to Fig. (1))

Let the center conductor of the cable protrude $2^{+0}_{-0.5}$ mm, and remove the outer conductor and the insulation.

Note (1). Finish the outer conductor and insulation vertically and uniformly.

Note (2). When cutting, be careful not to damage the center conductor.

Fig. (1)



Process 2. Solder the male contact to the center conductor of the cable (refer to Fig. (2), Fig. (3) and Fig. (4))

Fixtures and tools used: POD-T-2
20W soldering iron

- i) Preliminary soldering of the contact.
 - a) Fasten the contact holder (3) with a vice or the like and fit the male contact to the contact holder as shown in Fig. (2).
 - b) Insert a $\phi 0.5$ string solder into the solder hole of the male contact and perform preliminary soldering.
 - ii) Put the positioning plate of the center conductor (2) into the groove of the POD-T-2 proper.
 - iii) Mount the cable in Fig. (1) onto POD-T-2, as shown in Fig. (3). Pass the center conductor of the cable through the groove of the positioning plate of the center conductor (2), and screw in the tightening fixture (1) (4) at the position where the tip of the outer conductor of the cable strikes against (2) to fasten the cable.
 - iv) At the state shown in Fig. (2), insert the contact holder through the transverse hole of the POD-T-2 proper, and align the center conductor of the cable with the solder hole of the contact.
 - v) While heating the contact with the soldering iron, press the contact holder until the surface of the end strikes against the surface of (2).
 - vi) After the soldering work is finished, withdraw (2) from the main unit (1), and remove the cable from POD-T-2.
 - vii) After soldering, use a razor to finish the build-up uniformly on the circumference.
- Note (3). Be careful that extra solder does not flow onto the center conductor of the cable at the part 0.3 ± 0.05 in Fig. (4).

Fig. (2)

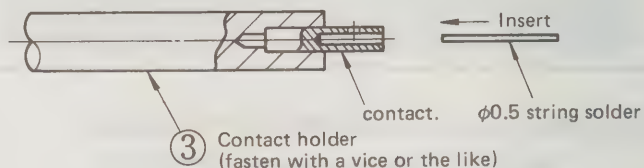
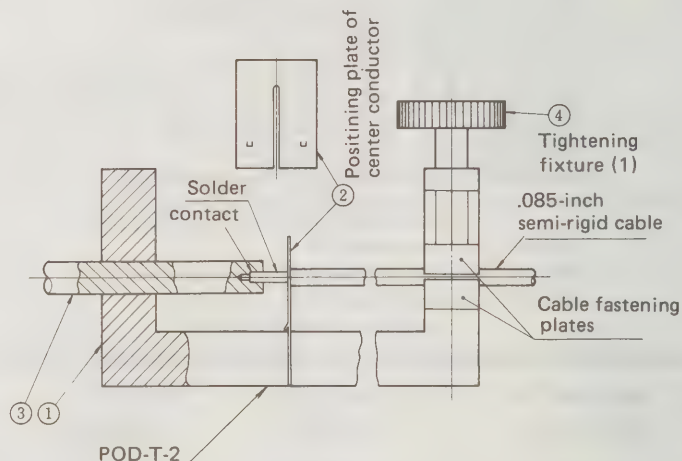


Fig. (3)



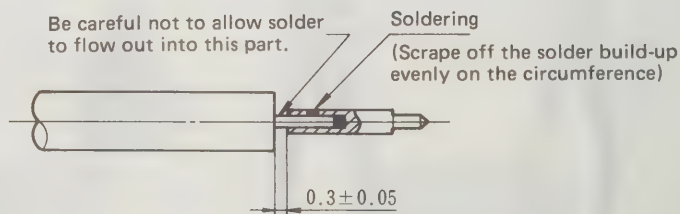
Process 3. Soldering the outer conductor of the cable and the connector proper.

(Refer to Fig. (5).)

Fixtures and tools used: POD-T-2
50W soldering iron

- i) POD-T-2 proper (1) is fastened with a vice in Fig. (5).
- ii) Fit the insulation seat positioning bar (5) into the connector. Insert it into the transverse hole of the main unit (1).

Fig. (4)



POD SERIES RF CO-AXIAL CONNECTORS

- iii) Insert the cable in the state shown in Fig. (4) into the connector as shown in Fig. (5). When the end of the cable has struck against the insulator of the connector, screw in the tightening fixture (1) (4) and fasten the cable.

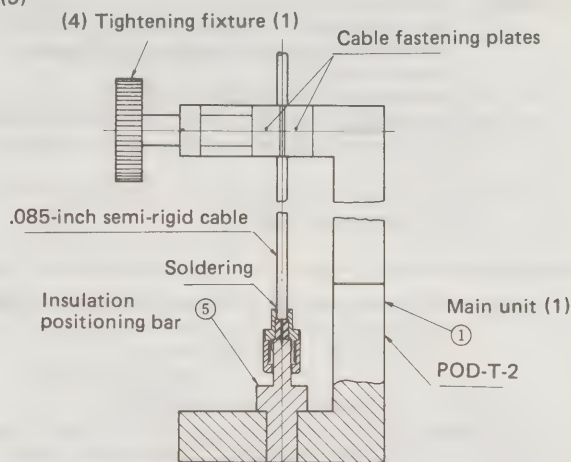
- iv) Fasten the connector proper by soldering it to the cable.

Note (4). Apply the solder uniformly on the circumference.

Note (5). Tighten the tightening fixture (1) (4) firmly so that the cable will not move as a result of the thermal stress produced by the soldering.

Note (6). Using sandpaper or the like, polish in advance with the part of the cable where the solder is to be applied so that it will go on easily.

Fig. (5)



2. POD-J-85

Process 1. Fasten the tightening fixture by soldering to the cable. (Refer to Fig. (6).)

Fixtures and tools used: Vice
50W soldering iron
POD-T-2

- i) In Fig. (6), fasten the main unit of (1) POD-T-2 in place with the vice.

- ii) As is shown in Fig. (6), pass the cable into the tightening fixture. When the cable has been inserted into the hole at the tip of the fastening fixture (2) (6), screw in the tightening fixture (1) (4) and fasten the cable.

- iii) Screw in the tightening fixture (2) (6) until the tip of the cable strikes against the end of the hole of the tightening fixture (2).

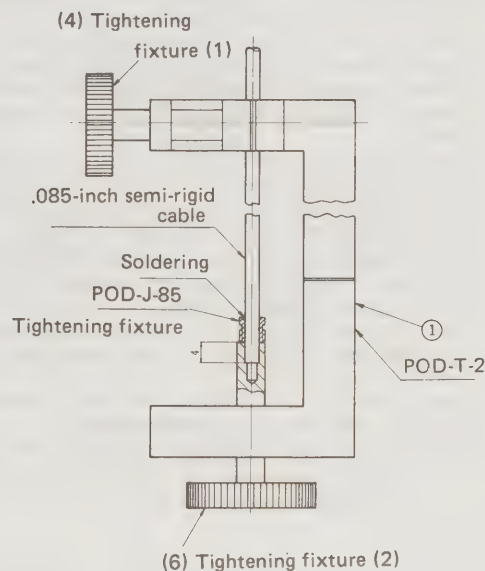
- iv) Fasten the shell to the cable by soldering.

Note (1). Tightening fixture (1) (4) must be screwed in tightly so that the cable will not move as a result of thermal stress produced by the soldering.

Note (2). The solder must be applied uniformly on the circumference.

Note (3). Using sandpaper or the like, polish in advance the part of the cable where the solder is to be applied so that it will go on easily.

Fig. (6)



Process 2. Cut off the outer conductor of the cable at the position of the tip of the tightening fixture. (Refer to Fig. (7).)

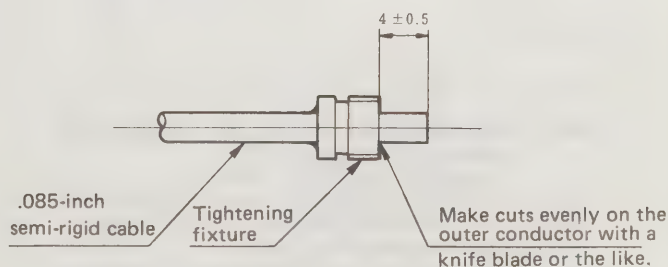
Fixtures and tools used: Knife
Cutting pliers

- i) Using a knife blade or the like, make cuts uniformly on the circumference of the tip of the cable tightening fixture in Fig. (7).

- ii) Grasp with cutting pliers, etc. the 4mm part of the cable protruding from the tip of the tightening fixture, bend it back and forth, bend the outer conductor at the cut part, and withdraw the unwanted part of the outer conductor.

Note (4). When cutting the cable, be careful not to damage the tip of the tightening fixture and be sure that the tip of the shell and the cut surface of the cable are on the same surface.

Fig. (7)



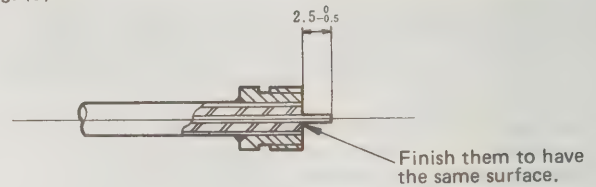
Process 3. Cut the cable insulation vertically at the tip of the tightening fixture and remove it. Cut the center conductor of the cable at $2.5^{+0}_{-0.5}$ mm. (Refer to Fig. (8).)

Fixtures and tools used: Knife

Note (5). Be sure that the end of the outer conductor of the cable and the end of the insulation will coincide.

Note (6). Be careful that the center conductor of the cable is not bent or damaged.

Fig. (8)



Process 4. Solder the end to the center conductor of the cable. (Fig. (9), Fig. (10), Fig. (11).)

Fixtures and tools used: POD-T-2

20W soldering iron

- i) Preliminary soldering of connector contact
 - a) Fasten the contact holder (3) with a vice or the like and fit the female end to the contact holder, as is shown in Fig. (9).
 - b) Insert a $\phi 0.5$ string solder into the solder hole of the female end, and perform preliminary soldering.
- ii) Insert the positioning plate of the center conductor (2) into the groove in the main body of POD-T-2.
- iii) Mount the cable in Fig. (8) onto POD-T-2, as is shown in Fig. (10) and pass the center conductor of the cable into the groove of the positioning plate of the center conductor. Screw in the tightening fixture (1) at the position where the tip of the outer conductor of the cable strikes against (2), and fasten the cable.
- iv) Insert the contact holder in the state shown in fig. (9) through the transverse hole of the main body of POD-T-2, and align the center conductor of the cable with the solder hole of the contact.
- v) While heating the contact with the soldering iron, press the contact holder until the surface of the end strikes against the surface of (2).
- vi) After the soldering work is finished, withdraw (2) from the main body of (1), and remove the cable from POD-T-2.
- vii) After soldering, use a razor or the like to finish the build-up uniformly on the circumference.

Note (7). Be careful that extra solder does not flow onto the center conductor of the cable at the part 0.3 ± 0.05 in Fig. (11).

Fig. (9)

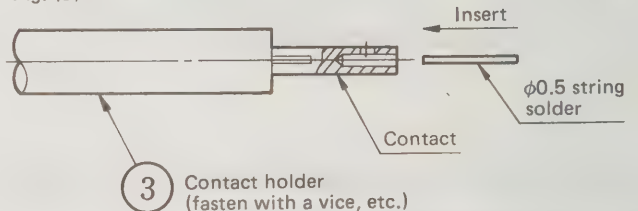


Fig. (10)

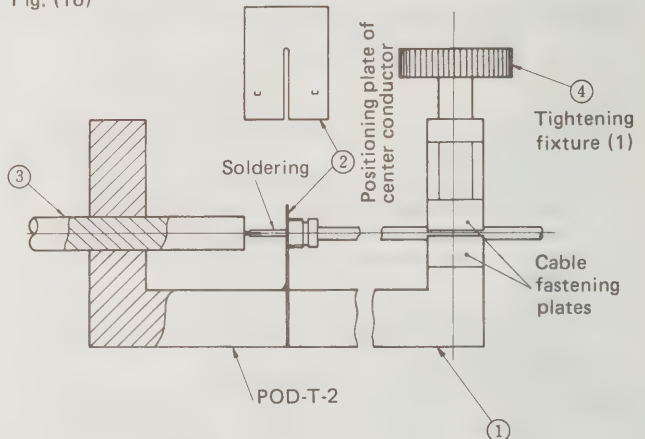
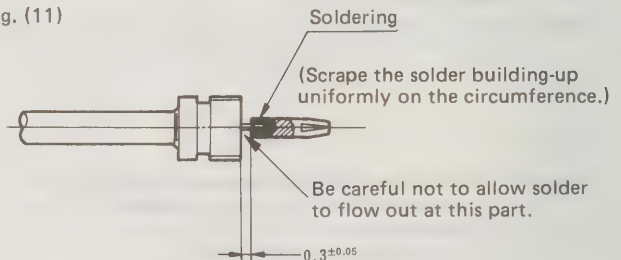


Fig. (11)



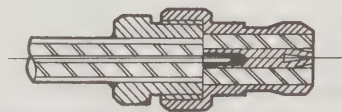
Process 5. Screw the block into the main body of the connector. (Refer to Fig. (12).)

Fixtures and tools used: Spanner

- i) When the block in Fig. (11) is screwed into the main body of the connector, the connection of the wiring will be completed, as in Fig. (12).

Note (7). The screw must be tightened with a torque of 20 kg-cm or more.

Fig. (12)



POD SERIES RF CO-AXIAL CONNECTORS

3. POD-LP-85

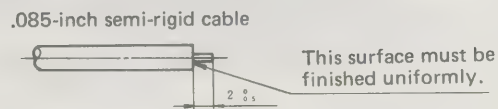
Process 1. Processing the cable end (Refer to Fig. (13).)

- i) Remove the outer conductor and insulation so that the center conductor of the cable will protrude $2^{+0}_{-0.5}$ mm.

Note (1). Finish the outer conductor and the insulation vertically and uniformly.

Note (2). When cutting, be careful not to damage the center conductor.

Fig. (13)



Process 2. Solder the center conductor of the cable to the male contact. (Refer to Fig. (14).)

Fixtures and tools used: POD-T-1

20W soldering iron

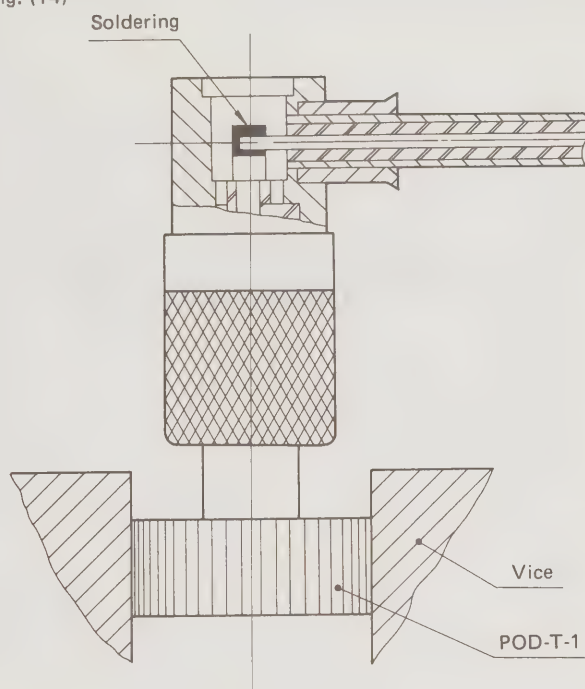
- i) Fit the connector to the POD-T-1 after it has been fastened in place with a vice.

- ii) Insert the cable, after its end has been processed, through the cord pipe inlet, as shown in Fig. (13), and solder the center conductor of the cable and the male contact

Note (3). Insert the cable until the tip of the outer conductor of the cable is aligned on the same surface as the inner surface of the connector shell, as shown in Fig. (14).

Note (4). In soldering, be careful not to allow solder to be applied to the outer surface of the male contact of the connector. To check the soldering strength, rotate the cable after soldering.

Fig. (14)



Process 3. Soldering of the outer conductor. (Refer to Fig. (15).)

Fixtures and tools used: POD-T-1

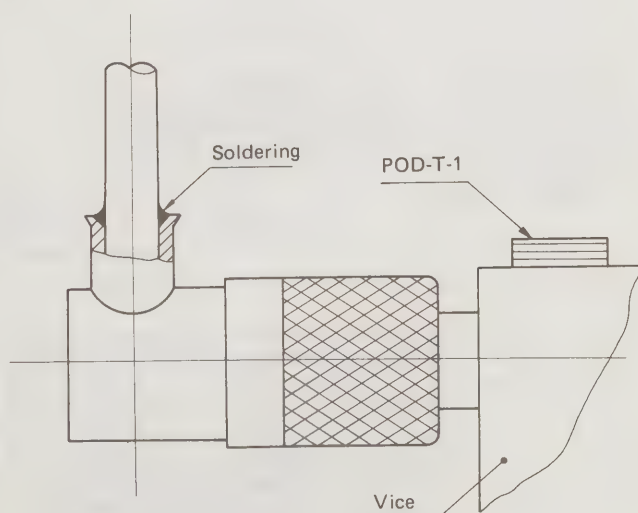
50W soldering iron

- i) Fit the connector to the POD-T-1 which is fastened in place by a vice, as shown in Fig. (15), and solder the outer conductor of the cable and the connector.

Note (5). The solder must be applied uniformly on the circumference, and soldering must be performed as speedily as possible.

Note (6). Polish the soldered part of the cable in advance with sandpaper or the like so that the solder will adhere easily to it.

Fig. (15)



Process 4. When the cover attached to the main unit of the connector is pressure-fitted, the connection of the wiring is finished, as shown in Fig. (17). (Refer to Fig. (16).)

Fixtures and tools used: Pressure-fitting bar
 $\phi 3.3 \pm 0.05$

Fig. (16)

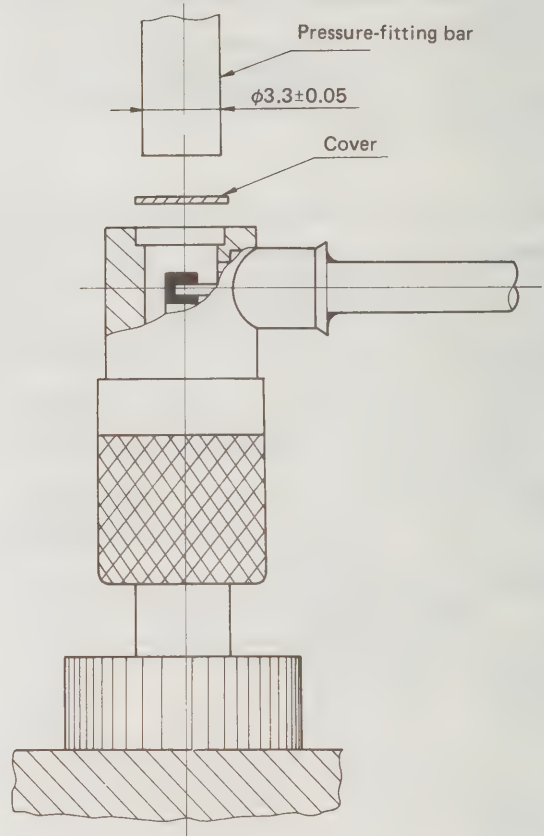
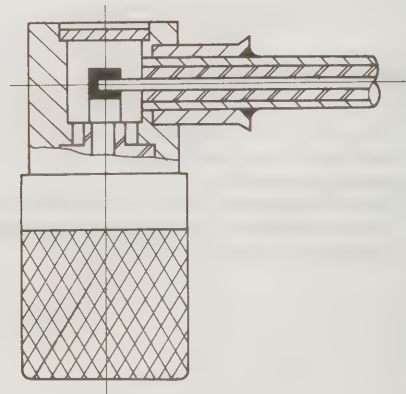


Fig. (17)



4. POD-P-1.5DV, POD-P-1.5DW, POD-P-2.5DV

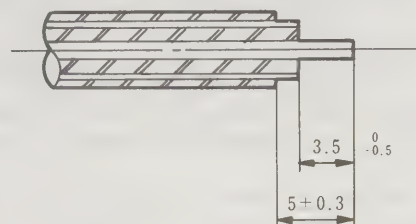
Process 1. Processing the cable end (Refer to Fig. (18).)

- i) Cut off 5mm of the outer covering of the cable. Next, cut off the outer conductor and insulation so that the center conductor will protrude $3.5^{+0}_{-0.5}$ mm.

Note (1). When cutting the outer covering and the insulation, be careful not to damage the outer conductor and the center conductor.

Note (2). The cable insulation must be cut vertically and uniformly.

Fig. (18)



Process 2. Soldering the center conductor. (Refer to Fig. (19).)

Fixtures and tools used: 20W soldering iron

- i) Insert the center conductor of the cable into the supplied Teflon washer, as shown in Fig. (19).
ii) Fasten the male contact in place with a vice or the like and solder it to the center conductor of the cable.

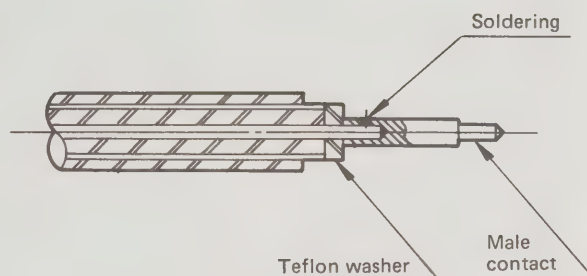
Note (3). Perform preliminary soldering of the male contact, using a $\phi 0.5$ string solder.

Note (4). Perform the soldering speedily so that the tip of the cable insulation will not be dissolved by the heat.

Note (5). Finish the solder build-up after soldering uniformly with a razor or the like. To confirm that soldering has been carried out accurately, pull the male contact with a force of about 1 kg.

Note (6). After soldering, be careful not to allow a gap to be produced between the insulation and the contact.

Fig. (19)



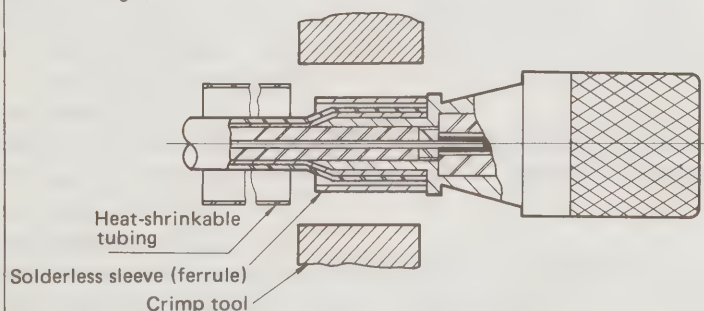
Process 3. After the heat-shrinkable tubing and ferrule (sleeve) have been passed onto the cable, insert the cable through the connector shell cord inlet, and crimp the ferrule (sleeve) with the specified tool. (Refer to Fig. (20).)

Fixtures and tools used: UM.MSS-T-1
MSS.UM(1.5)-T

Note (7). The tip of the outer conductor of the cable must be spread out in order to facilitate insertion.

Note (8). Cable insertion is finished when the cable insulation strikes against the connector insulation.

Fig. (20)



Applicable cable	Fixtures and tools used
1.5D-2V	UM.MSS-T-1*1
1.5D-2W	MSS.UM(1.5)-T
2.5D-2V	UM.MSS-T-1*2

*1 Perform crimp connection with the hexagonal hole marked 1.5.

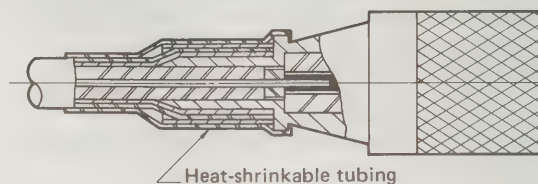
*2 Perform crimp connection with the hexagonal hole marked 2.5.

Process 4. Lay the heat-shrinkable tubing over the ferrule (sleeve) and shrink it by applying heat with a hair dryer or the like.

The state of the wiring when connection is completed is as shown in Fig. (21).

Note (10). When shrinking, the heat-shrinkable tubing must be caught on the groove of the shell.

Fig. (21)



PO6*SERIES* **RF** CO-AXIAL CONNECTORS

Low-profile ultrasmall coaxial connectors D.C. ~ 2000MHz

Overview

The PO6 (Push-on Lock Connectors Type VI) series consists of low-profile ultrasmall coaxial connectors for printed circuit boards. Its purpose is to provide high-density mounting.

The PO6 series is most suitable for high-density in-unit wiring for microwave bands and high-speed pulse transmission.



Characteristic Features

- (1) The series is low-profile.
Two models are available; one in which the height above the printed circuit board when coupled is 10.5mm (when PO6-R-RC or PO6-LP-196/U is fitted), and one in which it is 6mm (when PO6-LR-PC or PO6-P-196/U is fitted).
- (2) The series is ultrasmall in size.
The sizes have been reduced to about 80% in comparison with our company's UM type connectors (CR type), which have won an excellent reputation in mobile radio systems.
- (3) There is a high reliability.
Since the coupling parts have a lock mechanism which is unique to our company alone, the series has an unexcelled reliability when exposed to external forces such as vibrations, impacts, twisting, etc.
- (4) The series has a high degree of compatibility. The high-frequency characteristics are excellent. The V.S.W.R. is 1.2 or less from 0 to 2000MHz.
- (5) The standard cables are RG-196/U cables.

Uses

Microwave communication equipment, wired and wireless communication equipment, radio equipment, mobile radio equipment, IC testers, electronic measuring instruments, broadcasting equipment, etc.

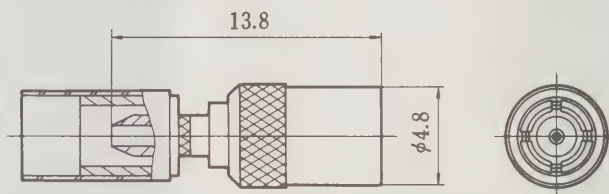
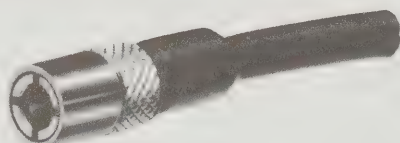
Performance characteristics

Items	Standard values
Impedance	50Ω
Insulation resistance	1000MΩ or more at 250V DC
Contact resistance	Center conductor 6.5mΩ or less, outer conductor 4mΩ or less at 1A DC
Withstand voltage	1 minute at 250V AC r.m.s.
Voltage standing wave ratio	1.2 or less at 0 ~ 2000MHz
Coupling force (withstand force)	500g or more

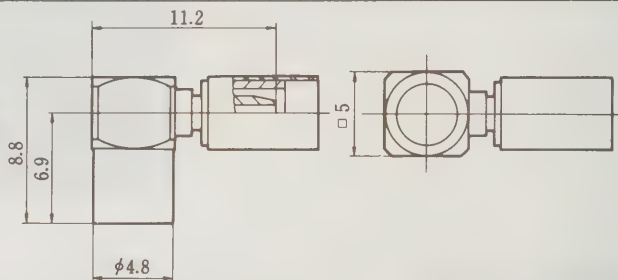
Guide to products

The following are typical products of the P06 series:

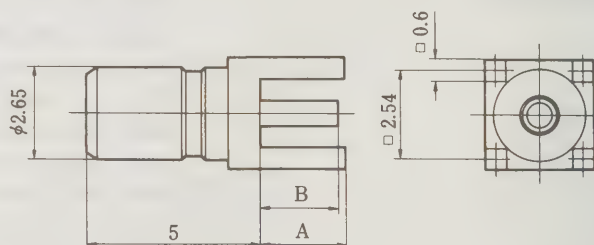
Part No.	Applicable cable
PO6-P-196/U	RG-196/U



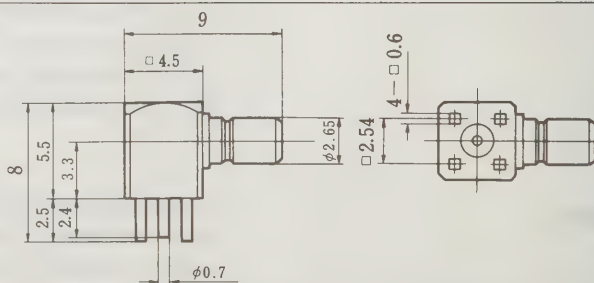
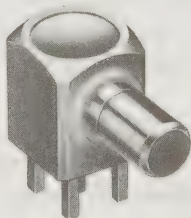
Part No.	Applicable cable
PO6-LP-196/U	RG-196/U



Part No.	A dimensions	E dimensions
PO6-R-PC	2.5	2.4
PO6-R-PC-1	3.3	3.2



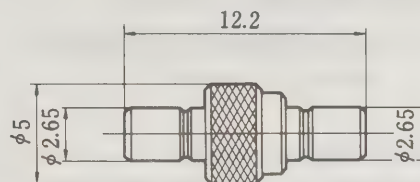
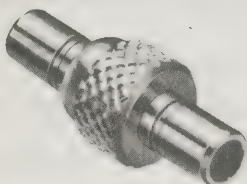
Part No.
PO6-LR-PC



P06 SERIES RF CO-AXIAL CONNECTORS

Part No.

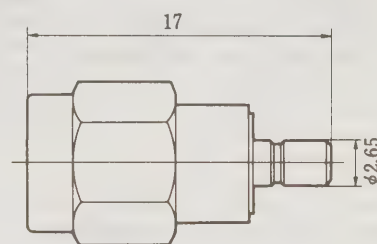
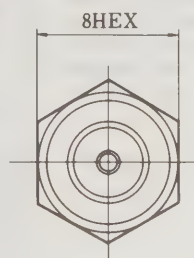
PO6-A-JJ



Three conversion adapters with the P06 series are available.

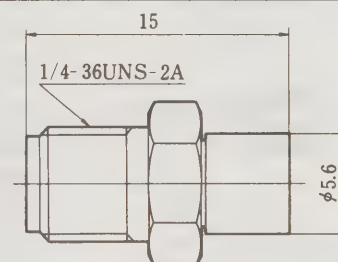
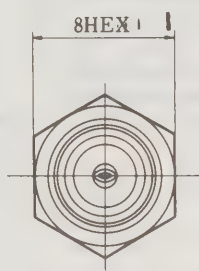
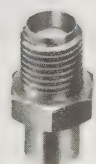
Part No.

HRMP-PO6J



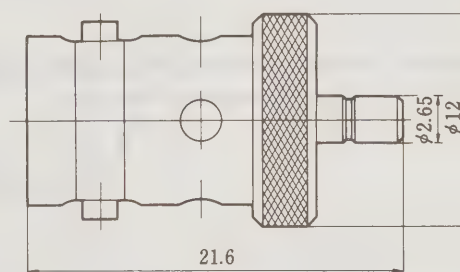
Part No.

HRMJ-PO6P



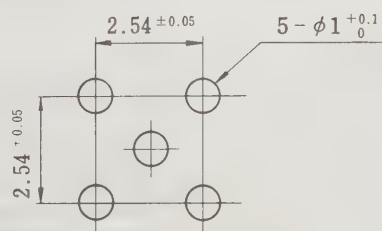
Part No.

BNCJ-PO6J



Drawing of holes drilled in printed circuit boards.

When P06-R-PC, P06-RC-PC-1 and P06-LR-PC are to be used, machine the printed circuit boards according to the drawing.

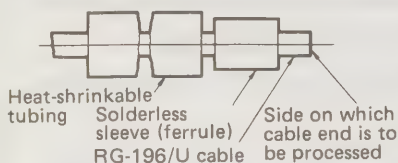


Method for connecting cable wiring.

Method for connecting wiring of P06-P-196/U

Process 1. Insertion of heat-shrinkable tubing and solderless sleeve.

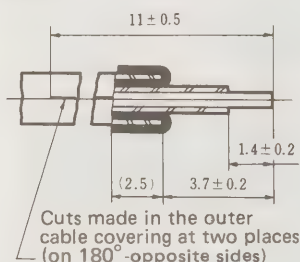
Fig. 1



- 1) Insert the heat-shrinkable tubing and the ferrule (sleeve) onto the cable. Insert first the heat-shrinkable tubing and then the ferrule (sleeve) from the side on which the cable end is to be processed. (The sequence is shown in Fig. 1.)

Process 2. Processing the cable end.

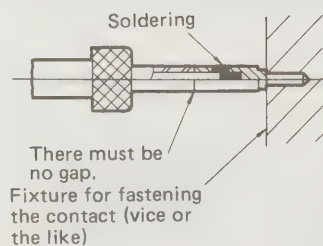
Fig. 2



- 1) The processing dimensions for the cable end are shown in Fig. 2. The cable end is processed in the following sequence:
 1. Remove the outer cable covering.
 2. Make cuts in the outer cable covering at two places.
 3. Fold back the outer conductor.
 4. Remove the cable insulation.

Process 3. Soldering of the male contact and the center conductor of the cable.

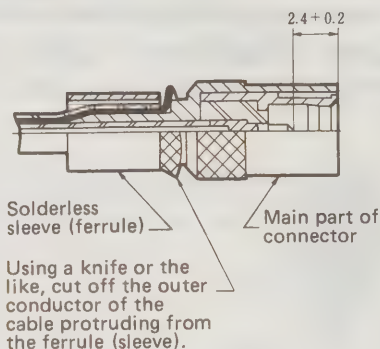
Fig. 3



- 1) Solder the male contact to the center conductor of the cable as shown in Fig. 3.
 1. Perform preliminary soldering at the soldering hole of the male contact with $\phi 0.5$ string solder.
 2. There must be no gaps between the surface of the male contact and the surface of the cable insulation.
 3. If the solder has run down onto the outer part of the male contact, finish that part uniformly with a knife or the like.
 4. To confirm that the soldering has been performed accurately, pull with a force of about 500g.

Process 4. Crimp connection of outer conductor of cable.

Fig. 4

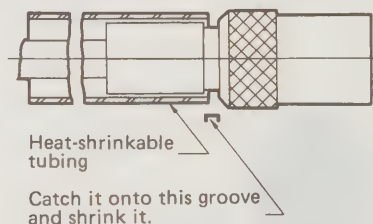


- 1) Insert the cable into the main part of the connector. Insertion of the cable is finished when it strikes. To confirm that it has been completely inserted, use vernier calipers or the like to measure the depth from the end of the main part of the connector to the end of the tip of the male contact, and make sure that it is 2.4 ± 0.2 .
- 2) Use P06-T-1 to make a crimp connection of the ferrule (sleeve) which was inserted in Process 1.

Process 5. Shrinking of heat-shrinkable tubing.

Fig. 5

- 1) After the heat-shrinkable tubing has been inserted into the cable in Process 1, shrink it with a heat gun or the like.



P06 SERIES RF CO-AXIAL CONNECTORS

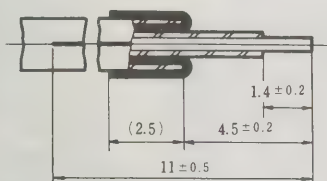
Method for connecting wiring of P06-LP-196/U

Process 1. Insertion of heat-shrinkable tubing and ferrule.

Same as process 1 of P06-P-196/U

Process 2. Processing the cable end.

Fig. 1



- 1) The processing dimensions for the cable end are shown in Fig. 1. The sequence in processing the end is the same as in Process 2 of P06-P-196/U.

Process 3. Crimp connection of outer conductor of cable.

Fig. 2

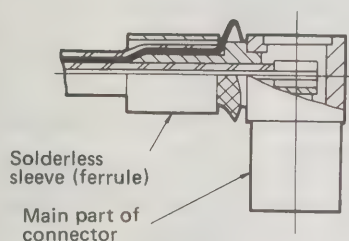
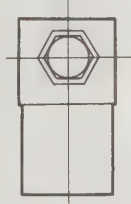


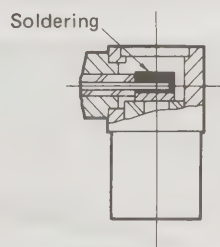
Fig. 3



- 1) Insert the cable into the connector. Insertion of the cable is finished when the surface of the cable insulator strikes against the surface of the male contact of the connector.
- 2) Use P06-T-1 to make crimp connections of the ferrule (sleeve) which was inserted in Process 1.
- 3) The crimping direction of the ferrule (sleeve) is to be as shown in Fig. 3.

Process 4. Crimp connection of center conductor of cable.

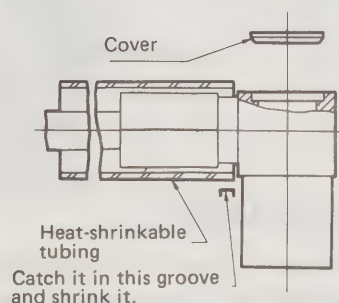
Fig. 4



- 1) Solder the center conductor of the cable to the male contact of the connector.
1. The tip of the soldering iron is about $\phi 0.8$, and $\phi 0.5$ string solder is used as the solder.
2. In soldering, be careful not to allow solder to be deposited onto the outer surface of the male contact of the connector.
3. Soils on the inside of the connector produced as a result of soldering should be washed off with thinner or the like and cleaned off with compressed air in order to prevent the occurrence of faulty insulation or inadequate withstand voltage.

Process 5. Pressure-fitting of the cover and shrinking of the heat-shrinkable tubing

Fig. 5



- 1) Using a drill press or the like, pressure-fit the cover into the connector with a pressure-fitting bar of $\phi 3.3 \pm 0.05$.
- 2) After the heat-shrinkable tubing has been inserted into the cable in Process 1, shrink it with a heat gun or the like.

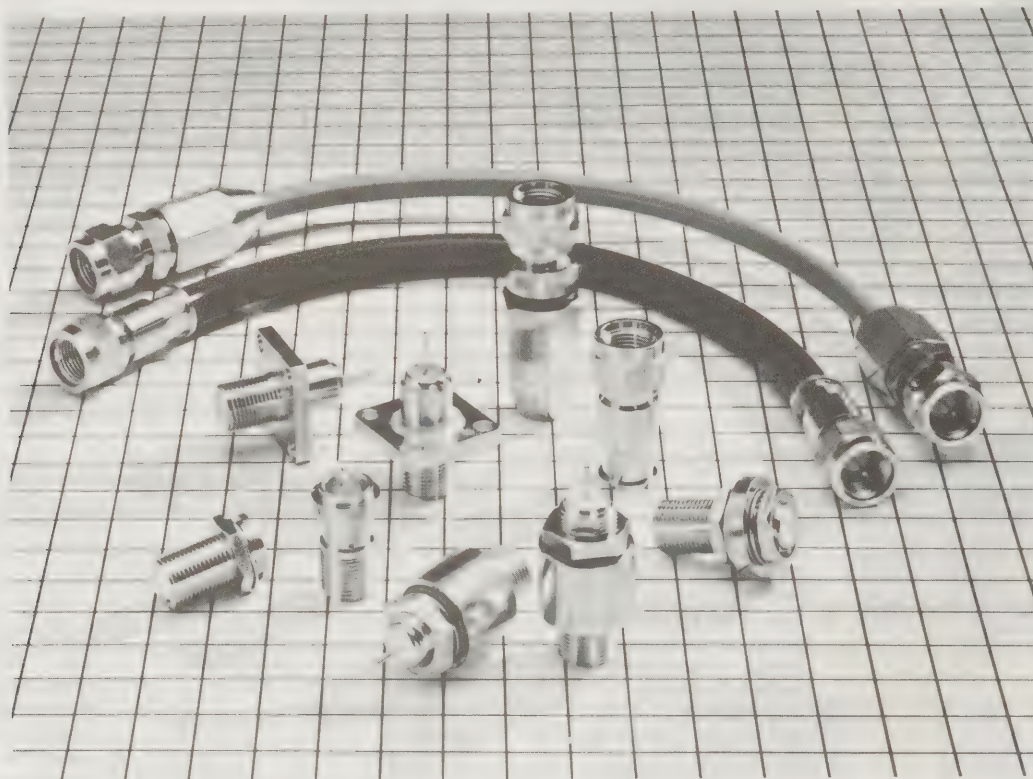
Circuit diagrams are available separately for those wishing to know in detail the method of connecting the wiring.

NF SERIES **RF** CO-AXIAL CONNECTORS

C15 type connectors for satellite broadcasting

Overview

C15 type connectors for satellite broadcasting (our company's NF series) conform with the specifications of Technical Standards RCZ-6015 of the Electronic Industries Association of Japan. The mechanical characteristics, electrical characteristics and environmental characteristics of the connectors are fully guaranteed.



Characteristic Features

- (1) The V.S.W.R. is excellent: 1.2 or less at frequencies of up to 1.5GHz.
- (2) The plugs are all provided with pin contacts. (There is no need to work the tip of the center conductor of the cable to a conical shape.)
- (3) In both the plugs and receptacles, the center contacts are completely stationary (in both the axial direction and the circumferential direction), and adequate measures have been taken to deal with cable shrinkage caused by temperature variations.

Uses

DBS receiving systems, DBS shared receiving systems.

Performance characteristics

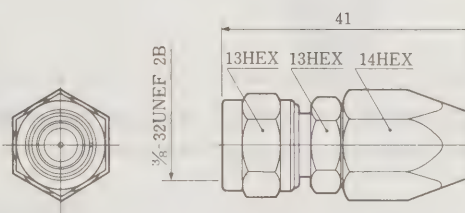
Items	Standard values
Impedance	75 Ω
Insulation resistance	500M Ω or more at 500V DC
Contact resistance	5m Ω or less at both center and outer conductors at 1A DC.
Withstand voltage	AC 500V
Voltage standing wave ratio	1.2 or less at 0 ~ 1500MHz
Waterproof properties	0.2kgf/cm ² (waterproof connectors only)
Cable connecting strength	25kgf

Guide to products

Waterproof plugs



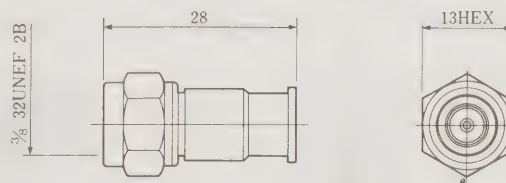
Part No.	Applicable cables
NF-WP-TVEFCX	JIS C 3502 (TVEFCX)
NF-WP-59/U	RG-59/U



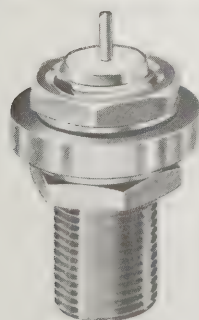
Non-waterproof plugs



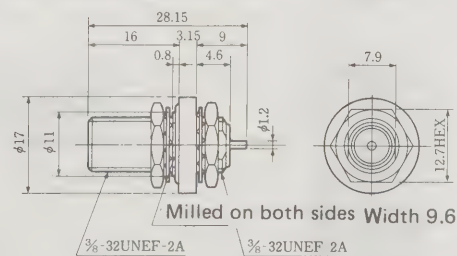
Part No.	Applicable cables
NF-P-TVEFCX	JIS C 3502 (TVEFCX)
NF-P-5CFB	JIS No. 381 (5C-FB)



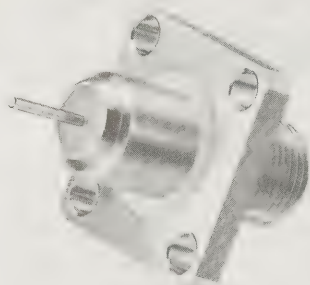
Waterproof receptacles



Part No.
NF-WR-2A

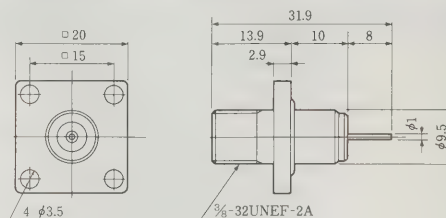


Note: The interior of the connector does not have a waterproof construction.



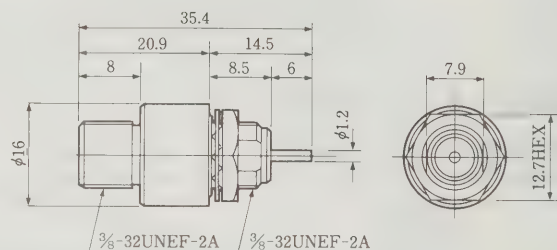
Part No.

NF-WR-3

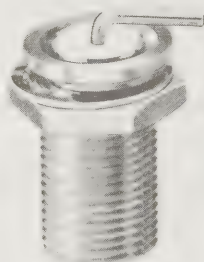


Part No.

NF-WR-5

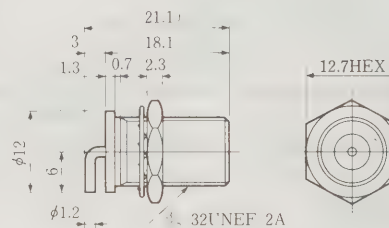


Non-waterproof receptacles



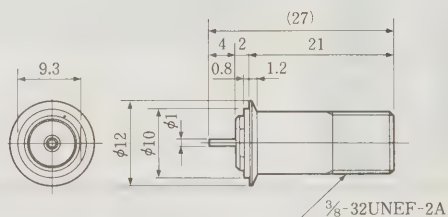
Part No.

NF-R-2



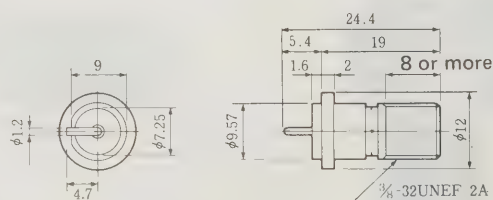
Part No.

NF-R-3



Part No.

NF-R-4A



Dedicated tools for connecting wiring

Part No.	Center conductor	Outer conductor
NF-WP-TVEFCX	FC-1 tool	
NF-P-TVEFCX		NF-T-1
NF-P-5CFB		

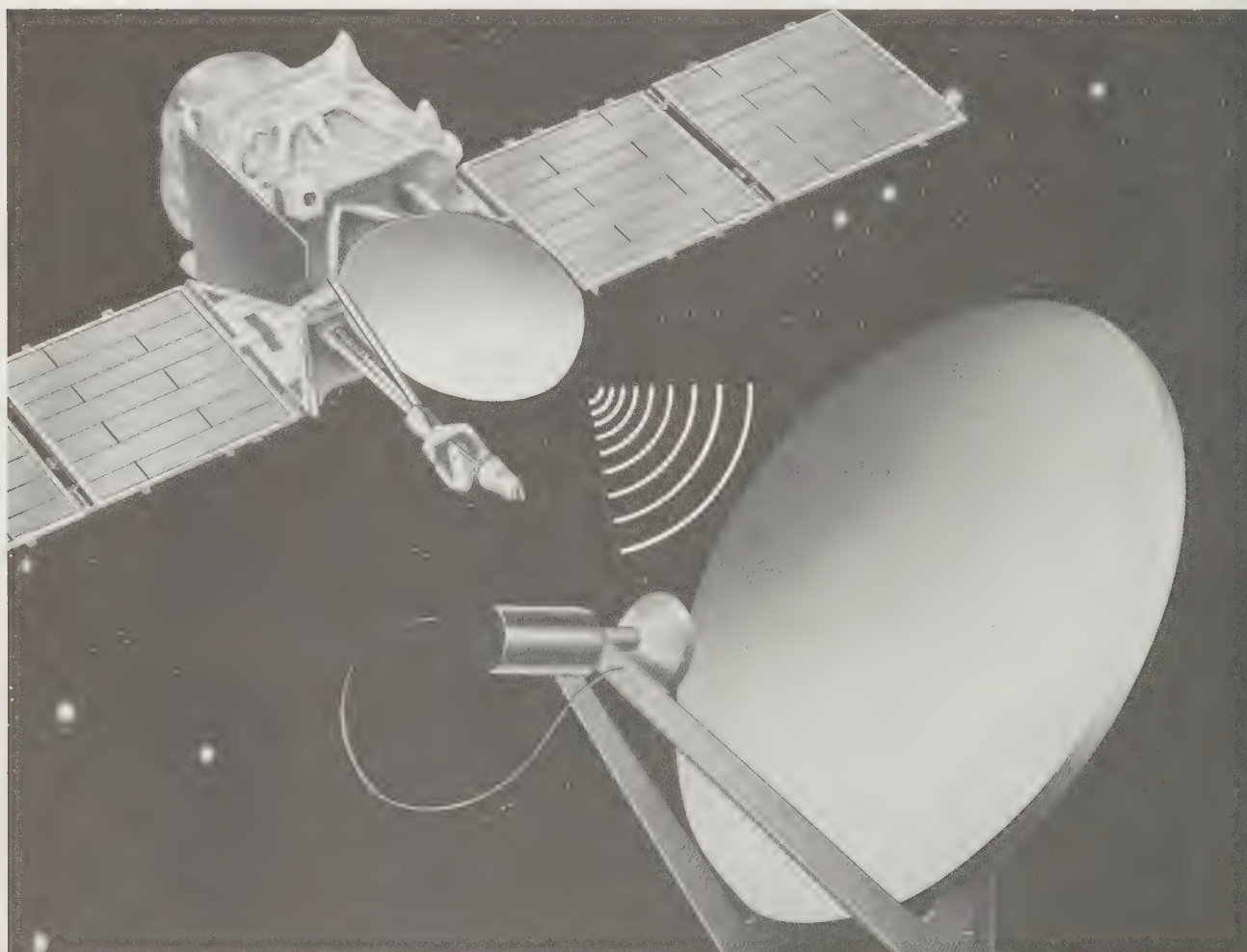
Note) Tools made by Hakusan Seisakusho should be used as FC-1.

C15 type Accessories for Hirose satellite broadcasting

Overview

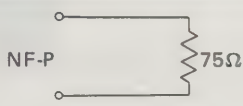
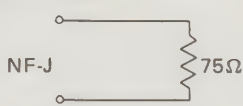
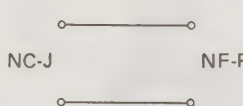
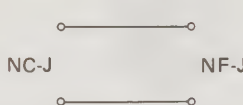


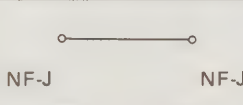
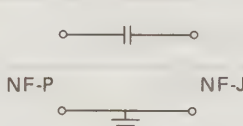
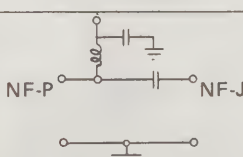
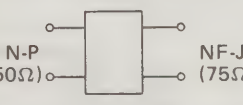
Satellite broadcasting is predicted to occupy a central position among the various new media in the future. It makes use of multiplex broadcasting techniques, which utilize the gaps between television broadcasting frequencies. With the development of new technologies utilizing satellite broadcasting, such as text broadcasting, facsimile broadcasting, broadcasting of still pictures, PCM (pulse code modulation) voice broadcasting, high-definition television, pay television, etc., it is expected that the needs for it will increase phenomenally. In such fields of high technology as well, Hirose provides products which accurately meet the needs of the market. It has a 47-year history as a manufacturer of purely Japanese-made connectors. Utilizing its originally developed technologies, high-precision machining techniques, and thorough quality control, it manufactures more than 10,000 types of connectors.

Anticipating the day in the near future when there will be wide dissemination of parabolic antennas shining on the rooftops of homes, development of this group of products is proceeding at a rapid pace. We are convinced that Hirose's C15-type accessories for satellite broadcasting receivers will be able to meet your company's needs.



MICROWAVE COMPONENTS

Specifications

Part No.	Functions	Connectors	Circuit	Frequencies [MHz]	Standing wave ratio Max	LOSS [dB] Max
NF-TMP-P	Resistive terminator	C15 plug	NF-P 	DC ~ 1500	1.032	—
NF-TMJ-P	Resistive terminator	C15 jack	NF-J 	DC ~ 1500	1.032	—
NCJ-NFP	Repeating connector	75Ω N-type jack C15 plug	NC-J NF-P 	DC ~ 1500	1.032	—
NCJ-NFJ	Repeating connector	75Ω N-type jack C15 jack	NC-J NF-J 	DC ~ 1500	1.06	—
NCP-NFP	Repeating connector	75Ω N-type plug C15 plug	NC-P NF-P 	DC ~ 1500	1.06	—
NCP-NFJ	Repeating connector	75Ω N-type plug C15 jack	NC-P NC-J 	DC ~ 1500	1.06	—
NF-A-JJ	Repeating connector	C15 jack	NF-J NF-J 	DC ~ 1500	1.032	—
HDC-NF-PJ	DC CUT	C15 plug C15 jack	NF-P NF-J 	10 ~ 1500	1.20	0.4
HB-NF-PJ	BIAS TEE	C15 plug C15 jack	NF-P NF-J 	900 ~ 1500 1000 ~ 1350	1.20 1.10	0.4
HI-NNF-PJ-50/75	IMPEDANCE PAD (λ/4 conversion)	50Ω N-type plug C15 jack	N-P (50Ω) NF-J (75Ω) 	900 ~ 1500 1000 ~ 1350	1.25 1.20	0.4

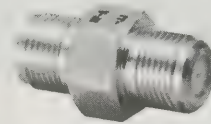
MICROWAVE COMPONENTS



NF-TMP-P



NF-TMJ-P



NF-A-JJ



NCJ-NFP



NCJ-NFJ



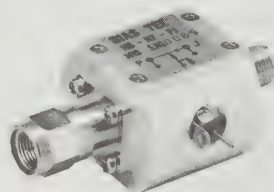
NCP-NFP



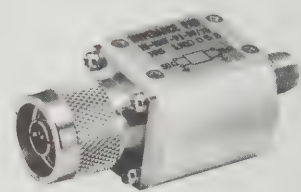
NCP-NFJ



HDC-NF-PJ



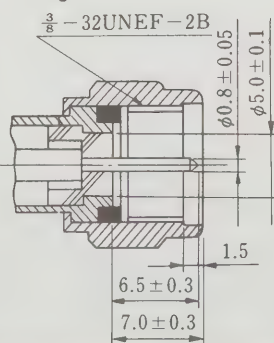
HB-NF-PJ



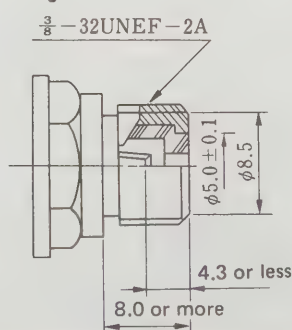
HI-NNF-PJ-50/75

Dimensions of opening parts

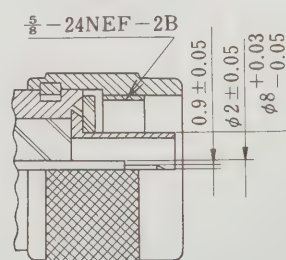
C15 plugs
Fig. 1



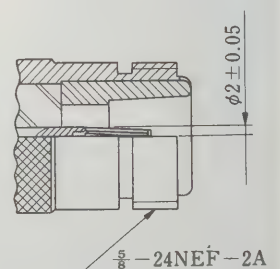
C15 jacks
Fig. 2



75Ω N-type plugs
Fig. 3

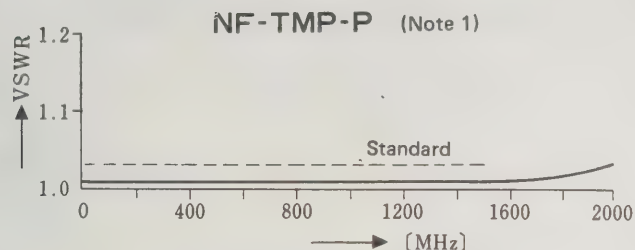


75Ω N-type jacks
Fig. 4



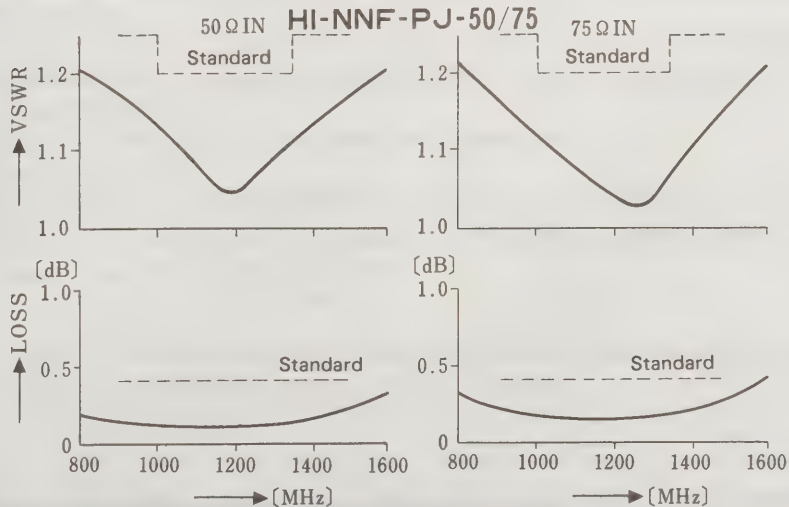
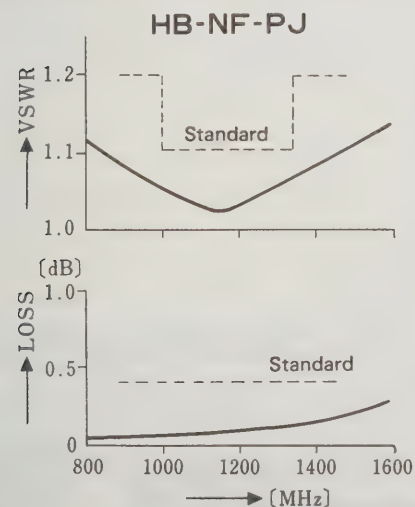
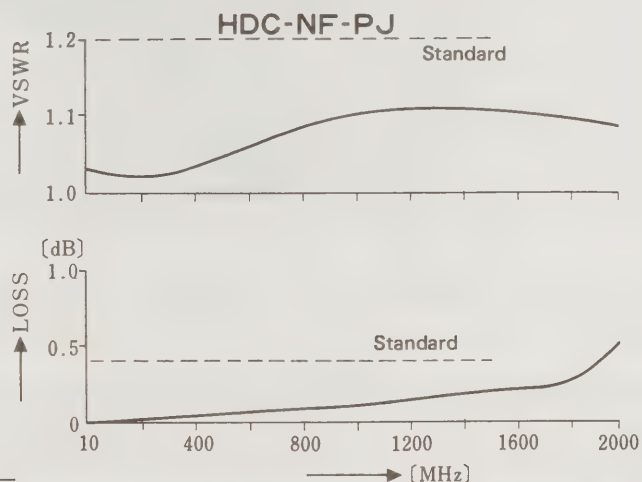
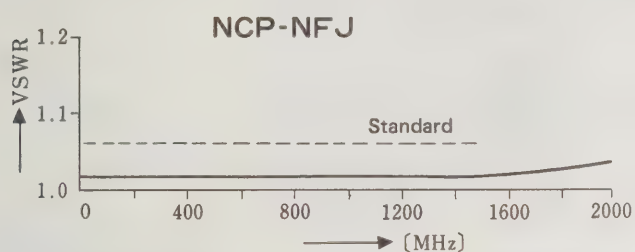
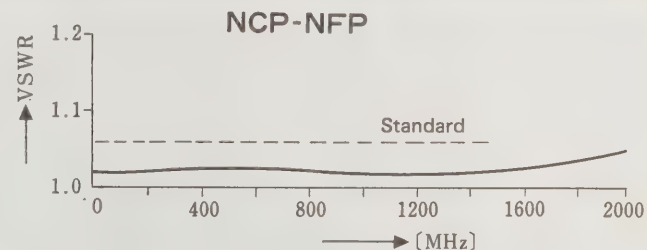
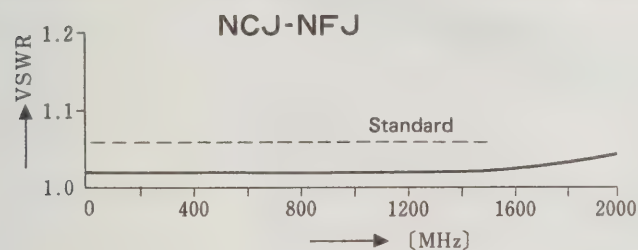
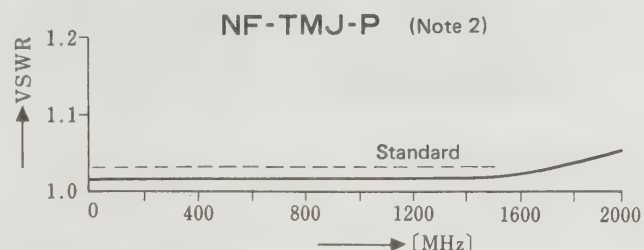
MICROWAVE COMPONENTS

DATA



Note 1. NCJ-NFP and NF-A-JJ are included in measurements of NF-TMP-P.

Note 2. NCJ-NFP is included in measurements of NF-TMJ-P.



MEMO :

A series of horizontal dashed lines for writing.

FL SERIES

RF CO-AXIAL CONNECTORS

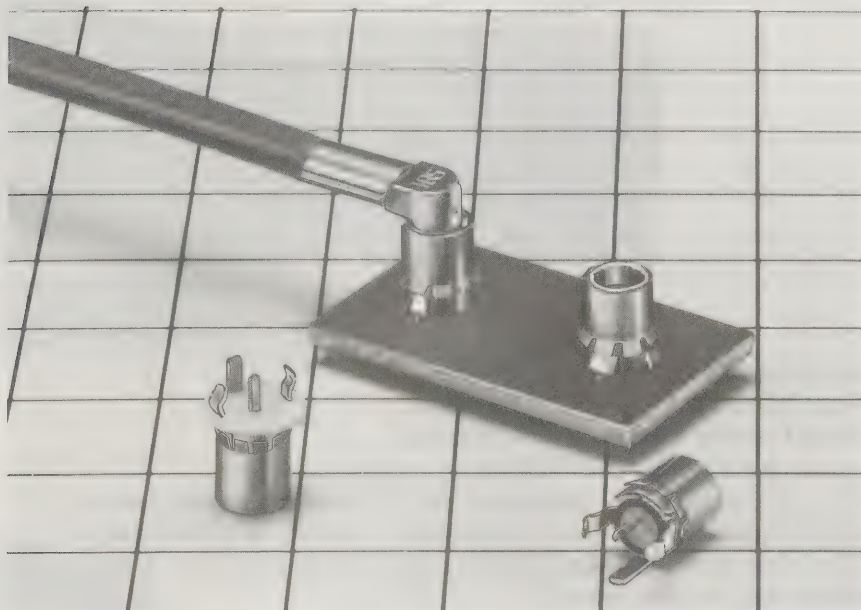
FINGER-LOCK COAXIAL CONNECTORS

(LOW-PROFILE MICROMINIATURE HIGH-FREQUENCY CONNECTORS)

D.C. ~ 1500MHZ

GENERAL

The FL (finger-lock) series connectors are low-profile microminiature coaxial connectors intended for high-density packaging of components on printed circuit boards. The FL series is ideal for high-density circuit board wiring in signal transmission applications at high frequencies up to 1 GHz.



FEATURES

- (1) Low Profile.
Fully mated, the FL series is only 10.5 mm, (0.413") in height, with a maximum diameter of 5 mm (0.197).
- (2) Low Cost.
Unique design and production methods assure quality and competitive pricing.
- (3) Fully Solderless Termination.
The FL series plug uses solderless crimping for both center conductors and outer conductors thus providing improved reliability and savings in assembly time.
- (4) High Reliability.
An exclusive Hirose interface design, using combined axial forces, allows consistent performance under vibration and assures simple and positive locking.
- (5) High-level Matching.
Maximum V.S.W.R. is only 1.2 at frequencies up to 1 GHz.
- (6) Recommended Cable.
Cable #1.5D-QEW and 1.5C-QEW•CW, manufactured by Fujikura Electric Wires Co., Ltd., are recommended for optimal performance. Contact factory for information regarding use with other cable.

APPLICATIONS

Typical applications include cellular telephones, radio communications equipment, electronic measuring instruments, CATV, control units, etc.

FL SERIES RF CO-AXIAL CONNECTORS

MATERIAL AND FINISH

Part name	Material	Finish
Shell	Brass or phosphor bronze	Silver plating
Center contact (male)	Brass	Gold plating
Center contact (female)	Phosphor bronze	Gold plating
Insulation	Polybutylene terephthalate (PBT)	Black

PERFORMANCE CHARACTERISTICS

(1) General performance characteristics

Item	Specification
Characteristic impedance	50Ω
Insulation resistance	1000MΩ or more (at 250 VDC)
Contact resistance	10 mΩ or less for both center and outer conductors (at 1 ADC)
Withstanding voltage	250 VAC (rms) for one minute
Coupling/removal force	300 gf or more
Life of contacts	50 times of use

(2) V.S.W.R.

a. When used on 50Ω lines

From DC to 1 GHz	1.2 or less
From 1 GHz to 1.5 GHz	1.25 or less

b. When used on 75Ω lines

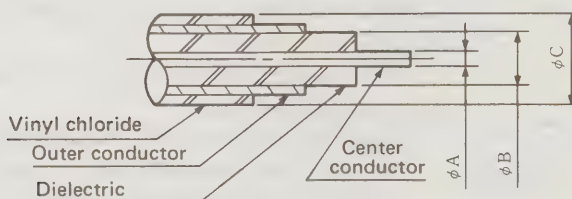
With FL-LP-1.5C-QEW-CW connectors, the FL series can also be used on 75Ω lines. However, the operating frequency is limited to a maximum of 500 MHz since the characteristic impedance of the connector body is 50 Ω.

V.S.W.R at this time is as follows:

From DC to 140 MHz	1.15 or less
From 140 MHz to 500 MHz	1.25 or less

SPECIFIED CABLE

The dimensions, construction, and materials of the cables for use with the FL series are as follows (use only these cables, since equivalent cables produced by other manufacturers differ in dimensional tolerance, material, etc.):



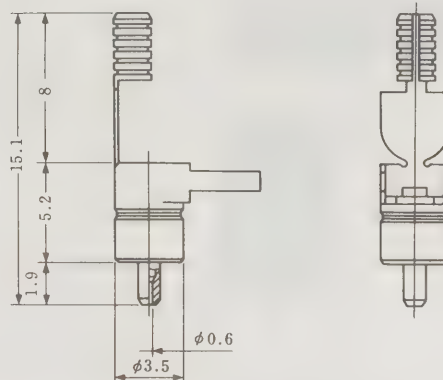
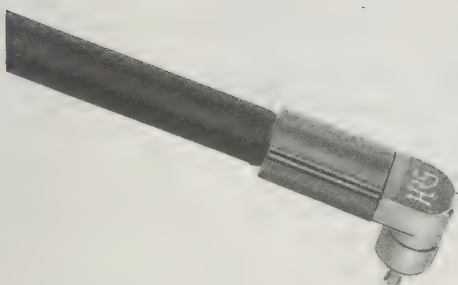
Cable name	Dimensions			Materials			Cable manufacturer
	ϕA	ϕB	ϕC	Center conductor	Dielectric	Outer conductor	
1.5D-QEW	7/0.18(0.54)	1.6 ± 0.05	3.4 ± 0.2	Annealed copper wire	Crosslinked polyethylene	Annealed copper wire	Fujikura Electric Wires Co., Ltd.
1.5C-QEW-CW	0.26	1.6 ± 0.05	3.4 ± 0.3	Copper welded wire	Crosslinked polyethylene	Annealed copper wire	Fujikura Electric Wires Co., Ltd.

FL SERIES RF CO-AXIAL CONNECTORS

PLUGS

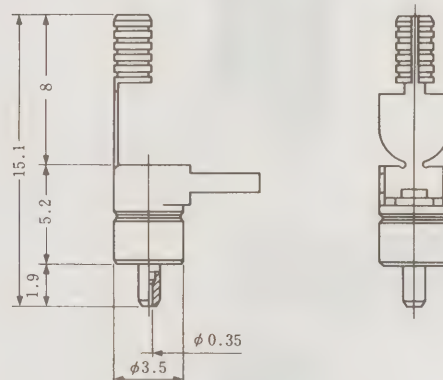
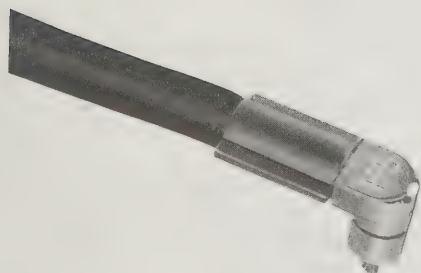
The following FL series products are available:

Product No.	Applicable cable
FL-LP-1.5DW	1.5D-QEW



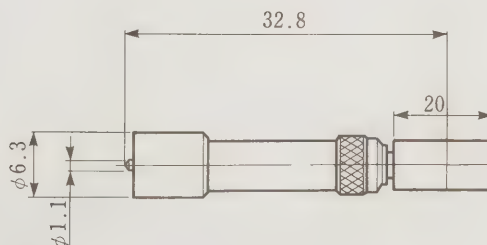
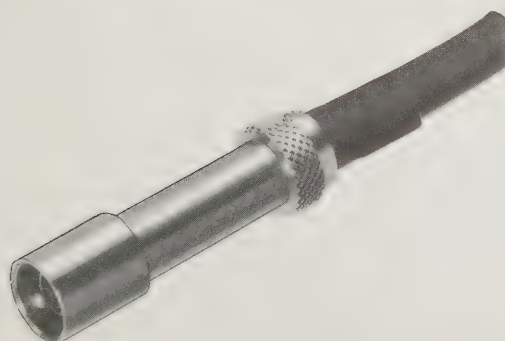
This product is provided with a crimp sleeve.

Product No.	Applicable cable
FL-LP-1.5C-QEW-CW	1.5C-QEW-CW



This connector is specially designed for use with 75Ω cable 1.5C-QEW-CW.

Product No.	Applicable cable
FL-P-1.5DW-1	1.5D-QEW

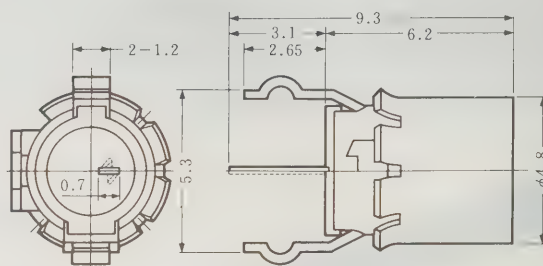
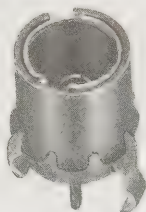


This TEST PROBE is designed to be used to check characteristics of signals and performance levels of the equipment. Due to the leverage created by the long body it is not advisable to use this connector for other than testing applications.

RECEPTACLES

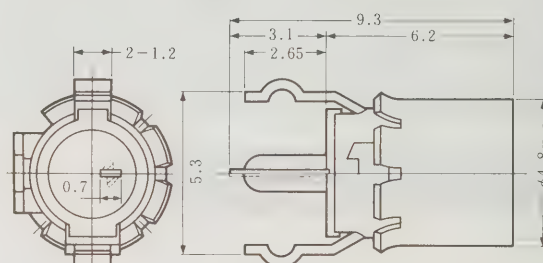
Product No.

FL-R-PC(1)



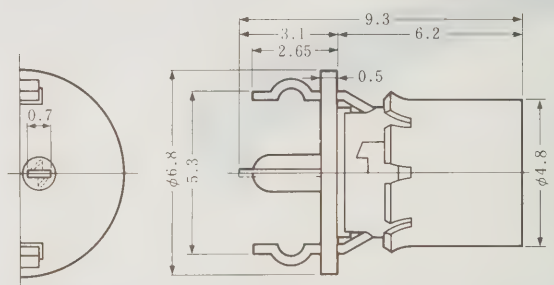
Product No.

FL-R-PC(2)



Product No.

FL-R-PC(3)



Teflon washer included to prevent potential shorting between connector and PCB traces.

PRECAUTIONS ON USE

(1) High-frequency leakage.

The FL-LP-1.5DW connector may allow high-frequency leakage from the gap in its L-bend. This leakage may be approximately 5 dB (at 900 MHz) than our UM (SMB) connectors. Please contact the factory for high-frequency leakage test data, if necessary.

(2) Mounting the receptacles on printed circuit boards.

- a. Use the FL-R-PC(3) receptacle when drawing patterns on printed-circuit-board mounting side. (This receptacle has an added insulating washer). Note that using the FL-R-PC(1) or FL-R-PC(2) receptacles may cause short circuiting between the central pattern and the outer conductor.
- b. Each of our receptacles is designed to prevent flux from flowing into the center conductor contacts, thus permitting soldering in an automatic solder bath. The hole dimensions, however, must be exactly as specified in LAYOUT DIAGRAMS FOR PRINTED CIRCUIT BOARDS.

Note: Excessive thru-hole diameter may cause solder to flow onto the printed-circuit-board mounting side during automatic soldering and damage the connector.

The soldering conditions:

Soldering temperature	250°C or less
Soldering time	5 sec or less

Inflow of solder may also occur due to factors other than the soldering temperature and soldering time. Contact the factory for details.

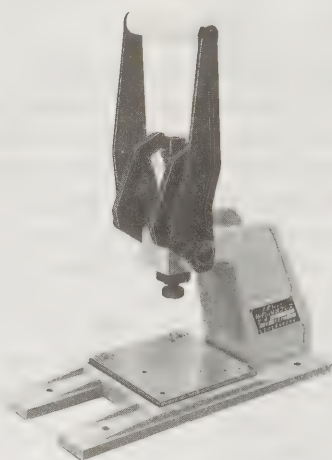
(3) Connector Insertion and Removal.

- a. To connect the FL series, align the coupling axes of both connectors and then snap the connectors together. Do not insert the connector at an angle.
- b. To release the connector, hook the tip of the FL-LP-N removal jig onto the connector lid, then pull the jig vertically along the connector coupling axis. If the removal jig is not used, hold the connector carefully by hand and pull it out along the coupling axis. Do not pull the attached cable when removing the connector. This will damage the connector.

FL SERIES RF CO-AXIAL CONNECTORS

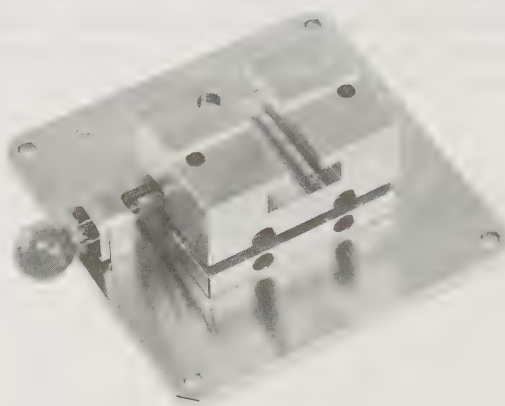
HI-FLEX CONNECTING PRESSES AND ATTACHMENTS

Hi-Flex Connecting Press



Product No.	Height	Width	Depth	Weight
Hi-Flex connecting press	440 mm	160 mm	350 mm	13 kg

Guide Plate With Block

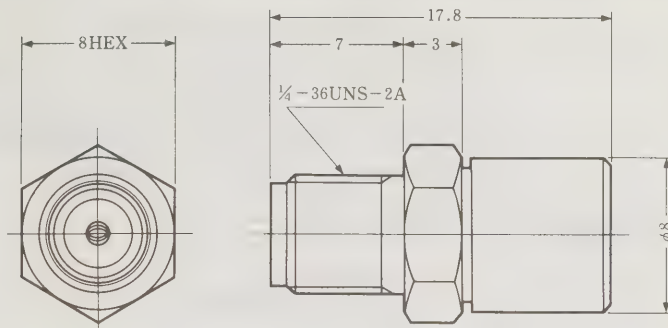
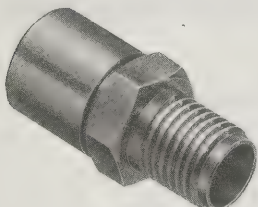


Product No.	Applicable connector
FL-LP-C (1.5D)	FL-LP-1.5DW
FL-LP-C (1.5C)	FL-LP-1.5C•QEW•CW

FL SERIES RF CO-AXIAL CONNECTORS

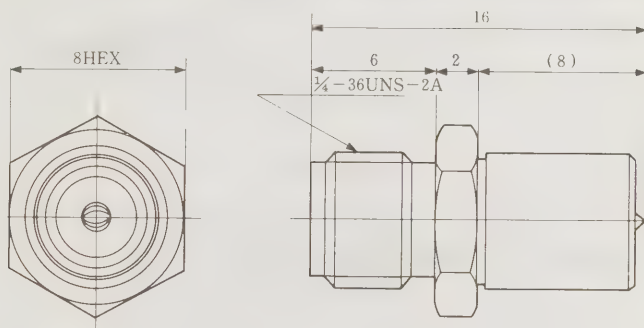
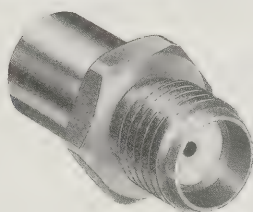
CONVERTER ADAPTERS

Product No.
HRMJ-FLJ



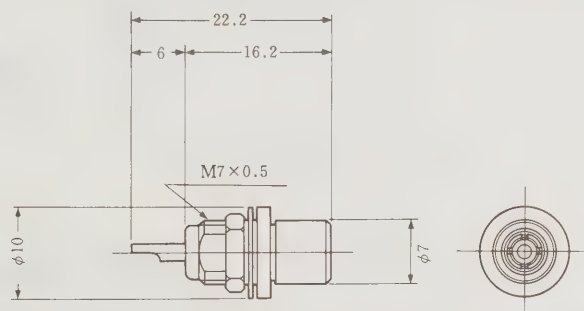
This converter adaptor is designed primarily as an aid in testing and therefore does not have a locking mechanism.

Product No.
HRMJ-FLP-1



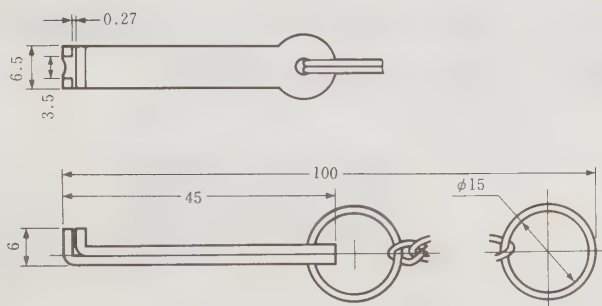
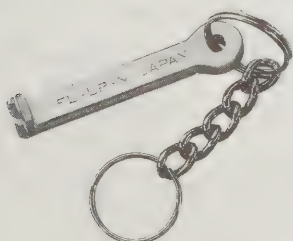
ATTACHMENTS

Product No.
FL-harness inspection
receptacle



This receptacle is used for checking the continuity, withstand voltages, etc. of harness products.

Product No.
FL-LP-N

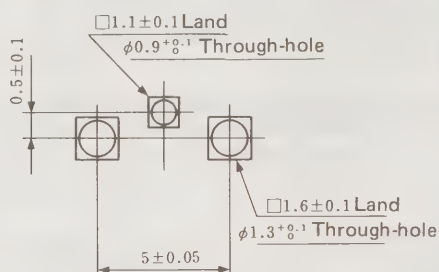


This removal jig aids in the removal of FL-LP-1.5DW and FL-LP-1.5C-QEW-CW connectors

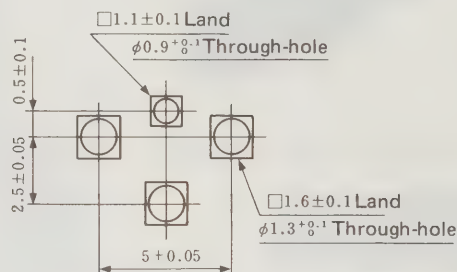
LAYOUT DIAGRAMS FOR PRINTED CIRCUIT BOARDS:

Prepare printed circuit boards in strict accordance with the diagrams shown below. Note that an excessive thru-hole diameter may cause solder to flow onto the printed-circuit-board mounting side during automatic soldering. This solder flow could damage the connector.

Example 1: Square type Land

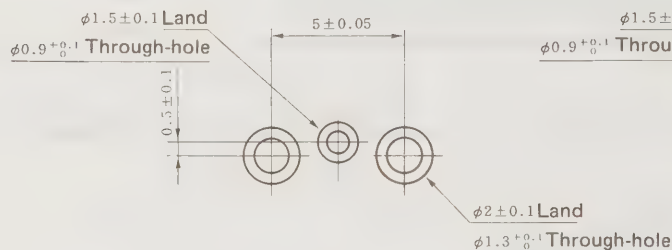


FL-R-PC(1)

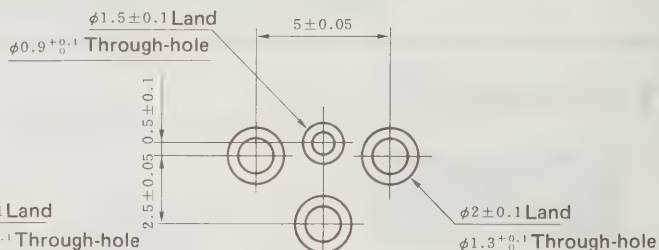


FL-R-PC(2)
FL-R-PC(3)

Example 2: Round type Land



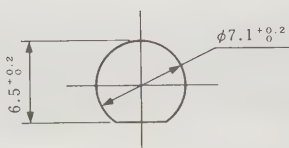
FL-R-PC(1)



FL-R-PC(2)
FL-R-PC(3)

Note: Dimensions of Lands show an example.

PANEL-MOUNTING HOLE DIAGRAM FOR FL HARNESS INSPECTION RECEPTACLES



TERMINATION METHODS 1 (FL-LP-1.5DW, FL-LP-1.5C.QEW.CW)

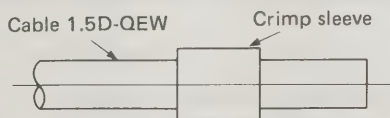


Fig. 1

1. Installing the crimp sleeve.

Mount the crimp sleeve on the cable as shown in Figure 1.

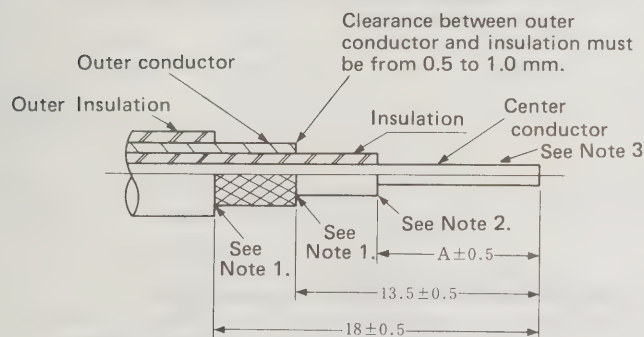


Fig. 2

2. Cable Preparation

- (1) Strip the outer insulation to 18 ± 0.5 mm from the cable end shown in Figure 2. Cut the outer conductor of the cable to 13.5 ± 0.5 mm. Cut the insulation by dimension "A" specified in the table below.
- (2) After preparing the cable per #1, wipe the center conductor with an alcohol-dampened cloth to remove any polyethylene residue from the surface of the center conductor.

Note 1: Do not damage the outer or center conductors when cutting the insulation and outer insulation.

Note 2: Cut the insulation uniformly. Do not pull the insulation while cutting it.

Note 3: Stranded wires of center conductor should not be spread out or bent.

The specified value of dimension "A" is shown below for each connector part number.

Connector part No.	Dimension A
FL-LP-1.5DW	11 ± 0.5
FL-LP-1.5C·QEW·CW	11 ± 0.5

* Jig (FL-LP-S) for this cable end treatment is available.

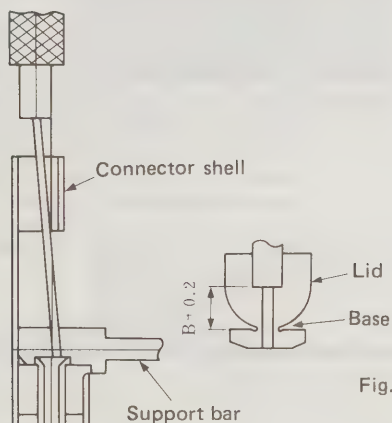


Fig. 3

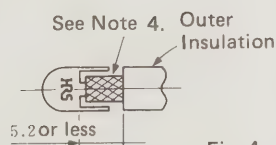


Fig. 4

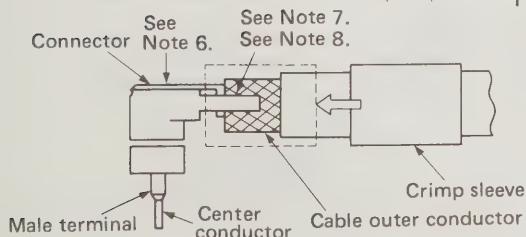


Fig. 5

3. Inserting the cable into the connector

- (1) Pass the cable center conductor through the connector shell, as shown in Figure 3. Then insert the center conductor into the hole in the male terminal while making sure that the connector shell passes between the outer conductor and the cable insulation. Insertion will be completed when the cable insulation reaches the section of dimension "B" specified in the table below.
- Note 4: The end of the outer conductor must be uniform with respect to the connector shell.
- Note 5: After insertion, there must be a clearance of about 2 mm between the cable center conductor and the end face of the male terminal.

- (2) Bend the connector lid, as shown in Figure 5.
- Note 6: Directly press the lid to bend it. Do not hold the connector by the connector shell when bending the connector lid.

- Note 7: Place the outer conductor in the support bar.
- (3) The clearance between the outer insulation and the end face of the LP shell must be 5.2 mm or less.
- (4) Slide the crimp sleeve further in up to the base of the support bar. (Fig. 5 dotted line section)
- Note 8: At this time, the support bar must be inside the crimp sleeve.

The specified value of dimension "B" is shown in the table below for each connector part number.

Connector part No.	Dimension B
FL-LP-1.5DW	2
FL-LP-1.5C·QEW·CW	2

- (5) Visually check the cable center conductor to ensure that its end is uniform with respect to the end of the male terminal. If the conductor does not have a uniform end, pull out hidden strands with pillars, etc.

FL SERIES RF CO-AXIAL CONNECTORS

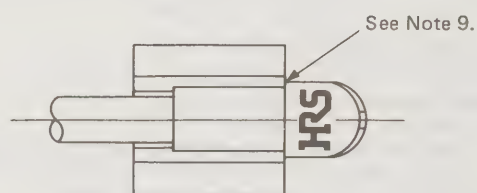


Fig. 6

4. Crimp connection of the outer conductor

- (1) Insert the mating section of the connector into the hole of the crimp connection jig, as shown in Figure 6.
Note 9: After insertion, make sure that the crimp sleeve is inserted fully in the base of the support bar.
- (2) Fully depress the lever of the crimp connection jig to make the connection.

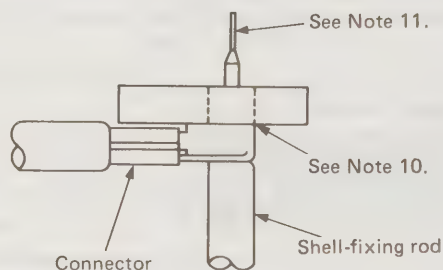


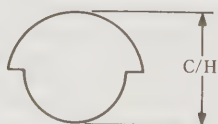
Fig. 7

5. Crimp connection of the center conductor

- (1) Insert the mating section of the connector into the hole of the crimp connection jig, as shown in Figure 7, and press the shell-fixing rod firmly against the shell.
Note 10: After insertion, make sure that the shell is inserted fully into the hole of the jig.
- (2) Fully depress the lever of the crimp connecting jig to make the connection. After connection, measure dimension C/H with a micrometer and check that the measured value is within the specifications shown in the table below.

Connector part No.	C/H
FL-LP-1.5DW	0.81 ~ 0.85
FL-LP-1.5C•QEW•CW	0.87 ~ 0.92

Note 11: The section of the center conductor protruding from the end of the male terminal will have been cut off by this assembly operation. If this section still remains uncut, break and remove it by hand.



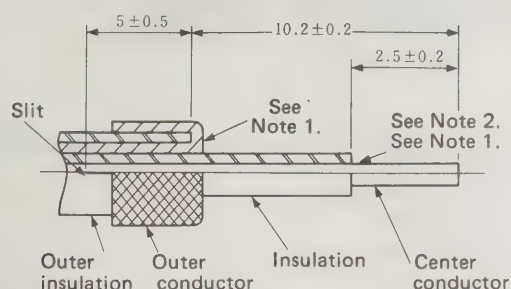
This shows one example of crimp connection.

Fig. 8

* For this crimp-connection process, the FL-LP-C (1.5D) or FL-LP-C (1.5C) jigs are available.

FL SERIES RF CO-AXIAL CONNECTORS

TERMINATION METHODS 2 (FL-P-1.5DW)

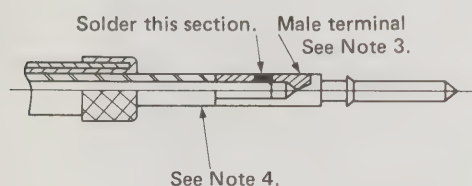


1. Cable preparation

- (1) Strip the cable outer insulation by 10.2 ± 0.2 mm from the end.
- (2) Make a 5 ± 0.5 mm slit in the cable insulation.
- (3) Fold back the outer conductor and cut the center conductor to 2.5 ± 0.2 mm from the end.

Note 1: Do not damage the outer or center conductors when stripping the insulation and outer insulation.

Note 2: Cut the insulation uniformly, do not pull the insulation when cutting it.



2. Soldering the center conductor

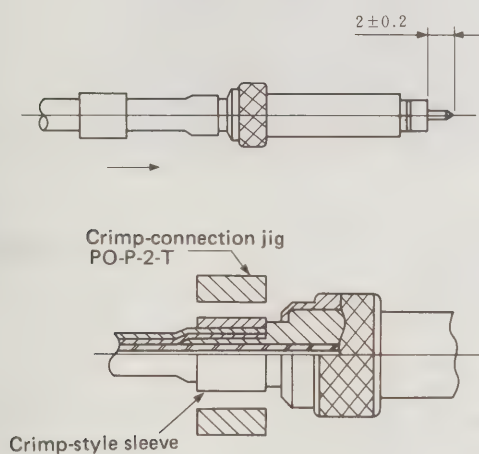
Solder the male terminal to the cable center conductor.

Note 3: Pre-solder the male terminal.

Note 4: Carry out the soldering operation to prevent melting of the end portion of the insulation due to heat.

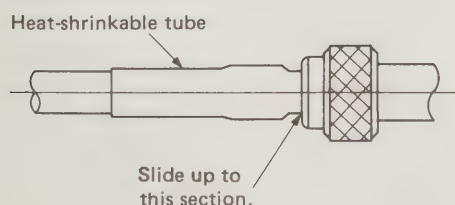
Note 5: After soldering, remove excess solder from the soldered portion.

Note 6: Use a soldering iron with a heating capacity of 20 to 30 watts.



3. Inserting the cable into the connector

- (1) Place the heat-shrinkable tube and the crimp sleeve onto the cable. Insert the block into the connector until the central terminal emerges 2 ± 0.2 mm cut from the shell end.
- (2) Fully slide the solderless sleeve in, and then calk it with the PO-P-2-T crimp-connection jig.



4. Mounting the heat-shrinkable tube

Slide the heat-shrinkable tube to the position shown, and then shrink it with a heat gun. Take great care during shrinking not to melt the cable outer insulation.

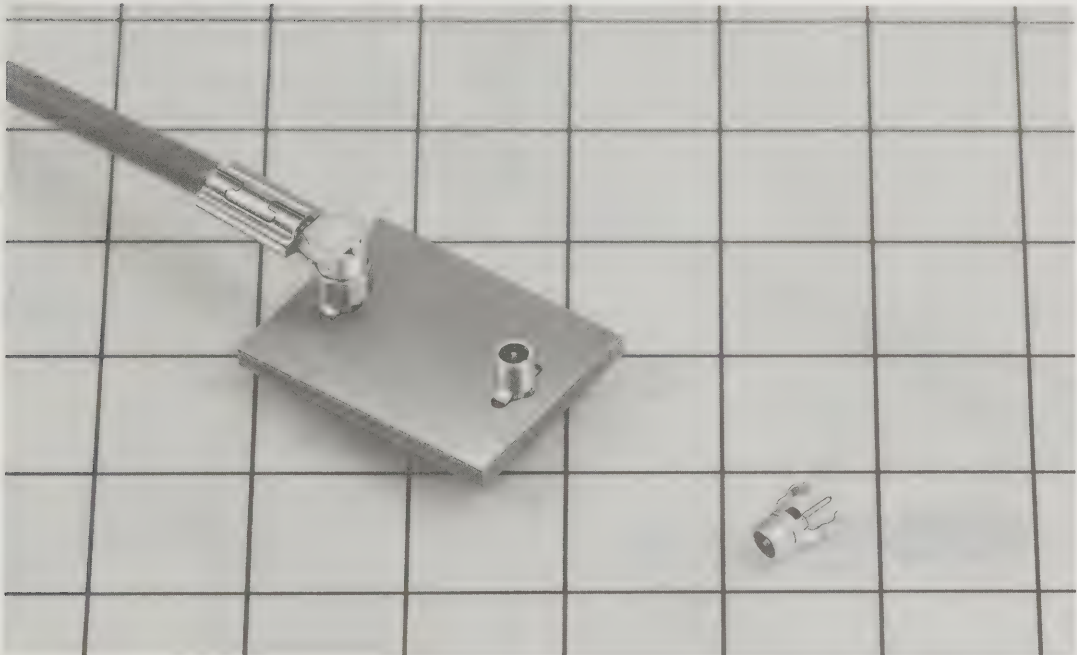
MEMO :

S.FL SERIES **RF** CO-AXIAL CONNECTORS

S.FL SERIES SUPER FL COAXIAL CONNECTORS

OUTLINE

SLF (Super FL Coaxial Connectors) Series Connectors are low profile super small type coaxial connectors for printed circuits for high density packaging. Compared with our existing FL type connectors, a low profile can be realized by a reduction in the mated height of approx 60% and higher density wiring is possible for high frequency transmission.



FEATURES

- (1) Low profile
The height off of the PCB when mated is 6mm or less.
- (2) Low cost
Plastic and forming products are used as in our FL type connectors.
- (3) High matching
High frequency performance is V.S.W.R 1.25 or less for 0-2500 MHz.
- (4) Exclusive-use cable is the 0.8D-QEW/CW (Fujikura Ltd.).

APPLICATION

To portable telephones, car telephones, radio communication units, electric instrument etc.

MATERIAL AND FINISH

Component	Material	Finish
Shell	Phosphor bronze	Silver Plating
Center contact (male)	Brass	Gold Plating
Center contact (female)	Phosphor bronze	Gold Plating
Insulation	Polyphenylene Oxyacid & Polyethylene terephthalate	

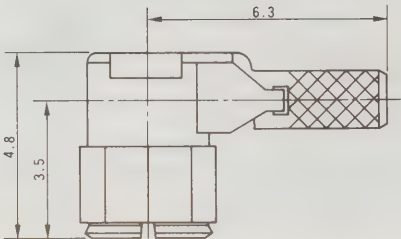
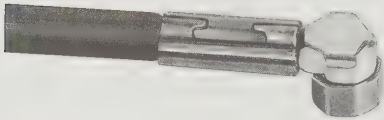
PERFORMANCE CHARACTERISTICS

(1) General performance characteristics

Item	Specification
Characteristic impedance	50Ω
Insulation resistance	1000MΩ or more (at 250VDC)
Contact resistance	10mΩ or less for both center and outer conductors (at 1 ADC)
Withstanding voltage	250VAC (rms) for one minute
Coupling/removal force	30gf or more
Life of contacts	50 times of use
VSWR	Less than 1.25 for D.C.~2500MHz

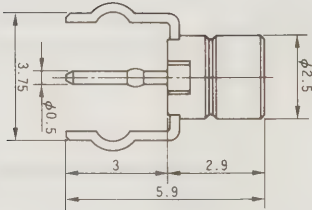
PLUG

Part No.	Applicable Cable
S.PL-LP-0.8W	0.8D-QEW・CW



RECEPTACLE

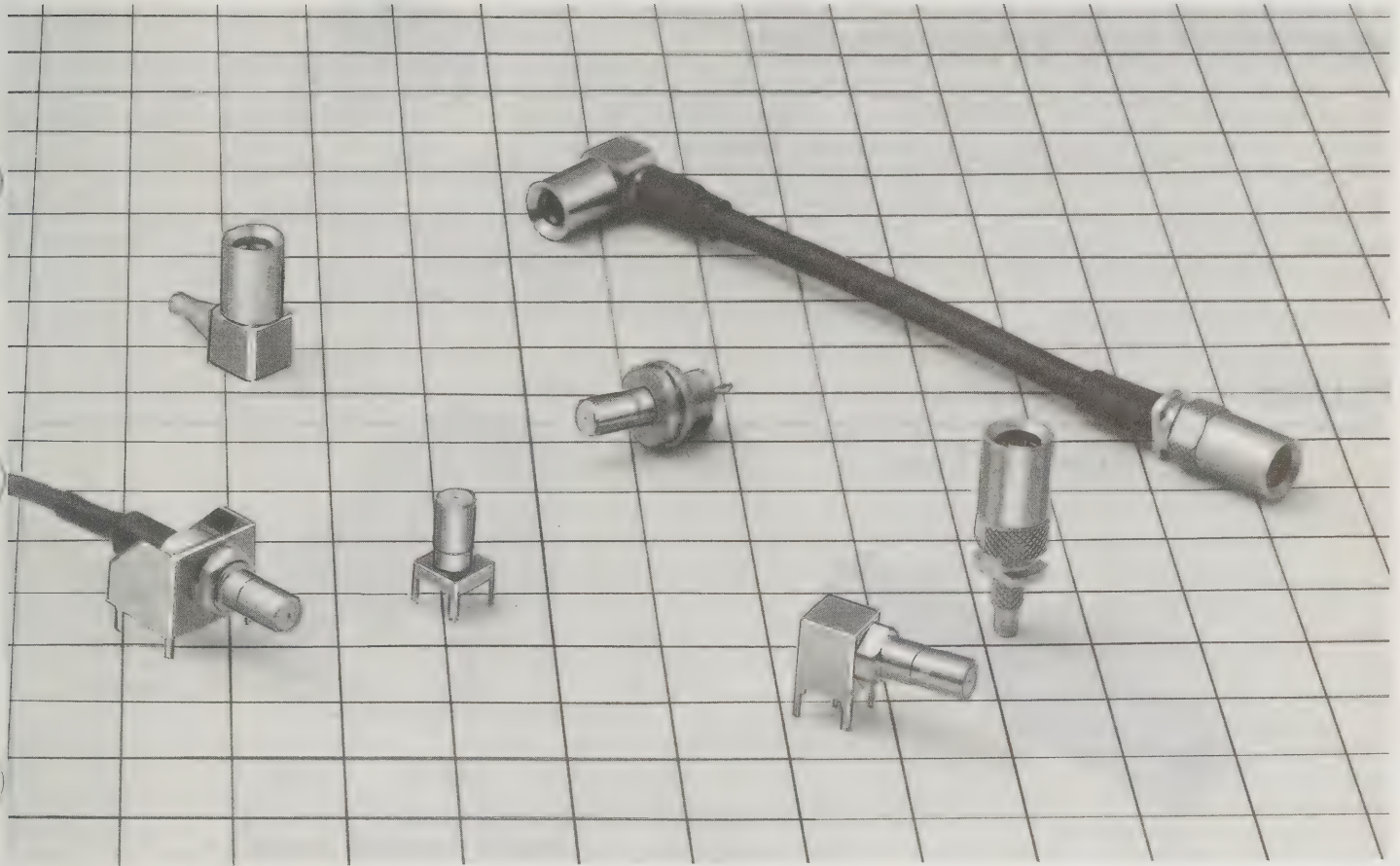
Part No.
S.FL-R-PC



75 OHM SUB-MINIATURE PUSH-ON LOCK COAXIAL CONNECTORS

GENERAL

The PL71 series are matched impedance sub-miniature 75 ohm coaxial connectors developed for high-frequency digital transmission using small overall diameter coaxial cable. These connectors are well suited when high-density packaging is a must.



FEATURES

- (1) Sub-miniature design has reduced overall size by 20% as compared with our standard 75 ohm coaxial connectors.
- (2) The unique coupling method was designed to insure electrical integrity and with an outer sleeve to increase stability to improve reliability.
- (3) To protect the small O.D. coaxial cable HIROSE has incorporated a fixed structure for the center contact. This will eliminate mechanical stress on the cable during insertion and removal or rotation of the connector.
- (4) VSWR for this sub-miniature coaxial connector is less than 1.2.

APPLICATIONS

These connectors are designed for use in radio equipment, electronic measuring equipment, CATV, or in any design where space is critical.

MATERIAL AND PLATING

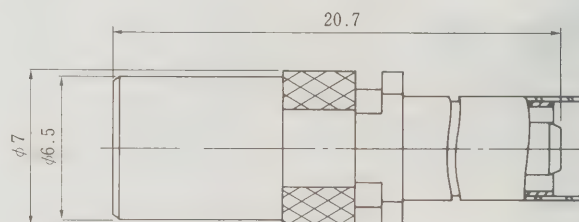
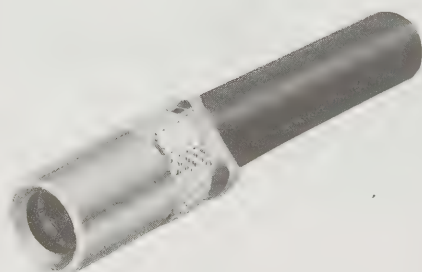
Component	Material	Plating
Shell	Brass	Nickel plating
Male contact	Brass	Gold plating
Female contact	Beryllium copper	Gold plating
Insulation	Tetrafluoride resin	
Lock spring	Beryllium copper	Nickel plating

PERFORMANCE SPECIFICATION

Item	Specification
Characteristic impedance	75 ohms
Insulation resistance	Less than 1000M ohms at 500VAC
Contact resistance	Center and outer contact less than 6m ohms at 1ADC
Withstanding voltage	1 min at 500VAC rms
VSWR	Less than 1.2 for 10MHz to 1GHz

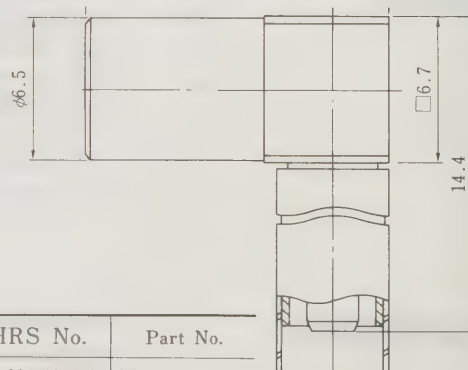
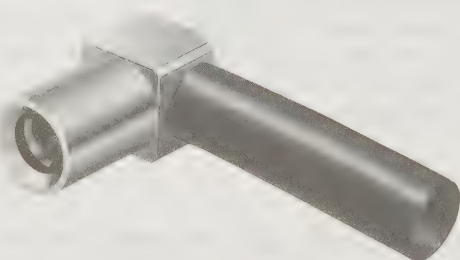
PLUGS

Straight Type



HRS No.	Part No.
CL334-0001-5	PL71-P-1.5CW

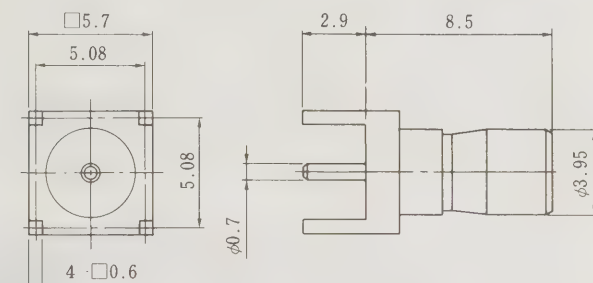
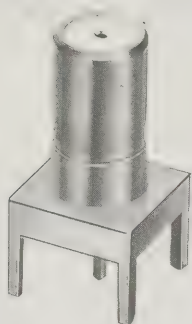
Right Angle Type



HRS No.	Part No.
CL334-0006-9	PL71-LP-1.5CW

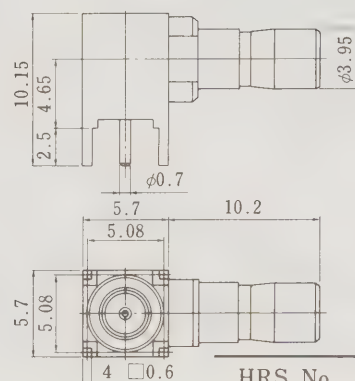
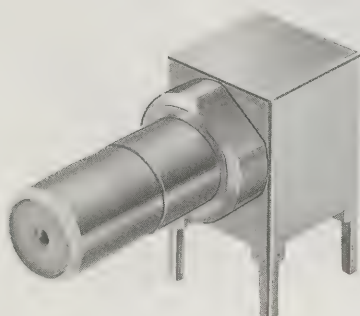
RECEPTACLES

Straight Dip Type



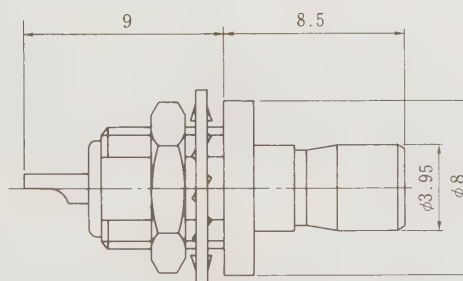
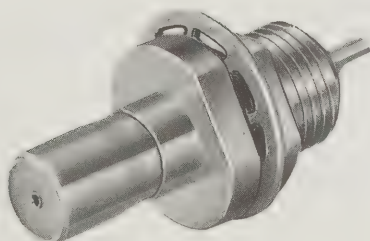
HRS No.	Part No.
CL334-0011-9	PL71-R-PC

Right Angle Dip Type



HRS No.	Part No.
CL334-0016-2	PL71-LR-PC

Panel Mount Type



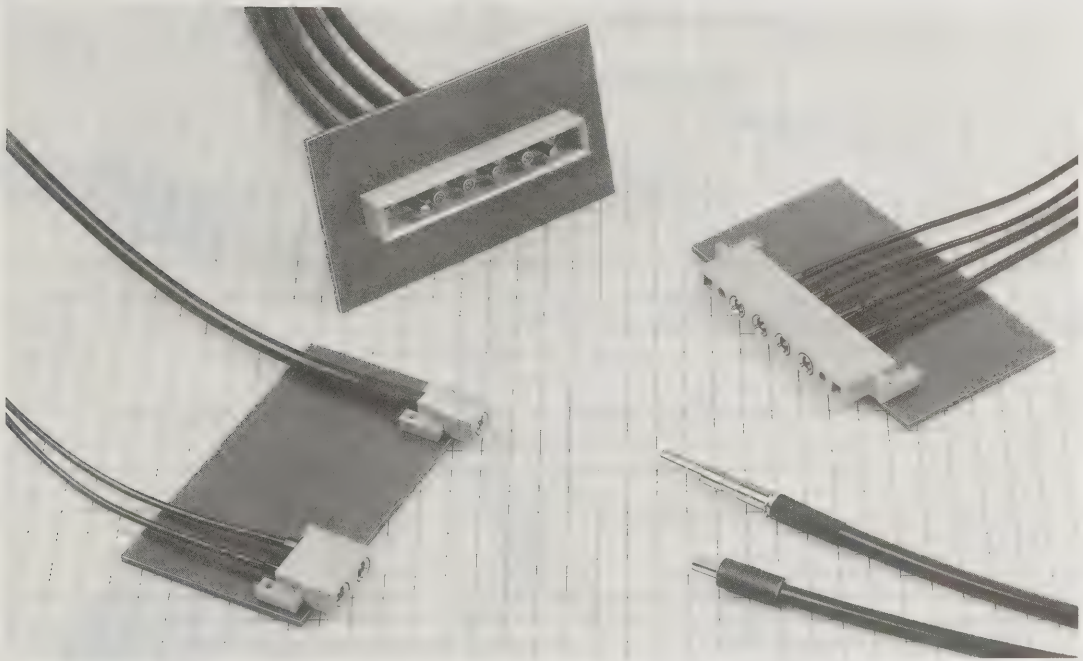
HRS No.	Part No.
CL334-0021-2	PL71-R

PO73 SERIES **RF** CO-AXIAL CONNECTORS

COAXIAL CONNECTORS FOR USE WITH HRP1 SERIES AND PCN11MF SERIES **P073 SERIES**

OUTLINE

P073 Series connectors are plug-in type high frequency coaxial connectors with a nominal impedance of 75Ω which are optimum for packaging of terminal units of microwave digital system communication networks such as for public telecommunication circuits.



FEATURES

- (1) The P073 Series connectors are used as composite connectors in combination with the HRP1 Series and the PCN11MF Series, and are suitable for high density packaging. (Coaxial connectors and optical connectors can be used in the same connector housing.)
- (2) Excellent connecting characteristics and mechanical durability are realized by applying the floating function to coaxial and optical connectors and connector housing.
- (3) Coaxial connectors (plug) incorporated in the connector housing can be detached in one-core units where the connector housing is coupled. This detachment can be made without tools by the system of sliding the snap-out ring attached to the coaxial connectors, and excellent workability of construction and maintenance is realized.

APPLICATION

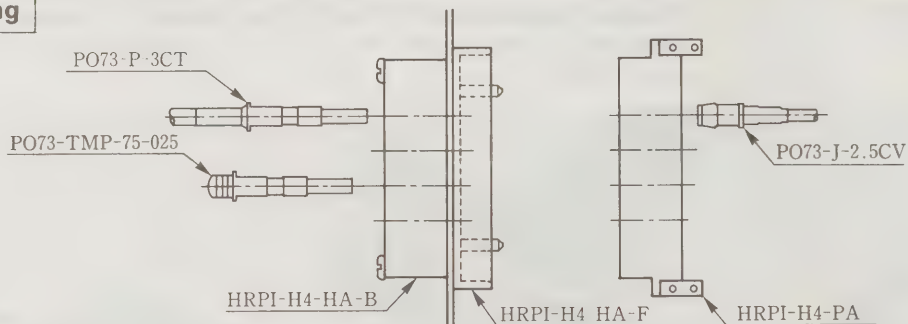
To communication machinery, transmission and exchange units.

PERFORMANCE SPECIFICATION

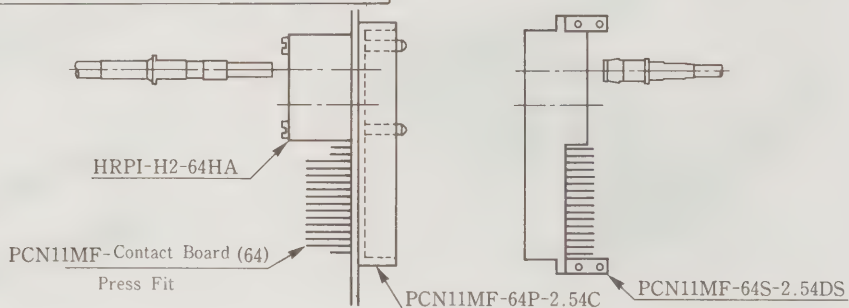
Item	Specification
Contact resistance	Less than 20m Ω
Insulation resistance	1000M Ω or more at 500V DC
Withstanding voltage	1 min at 1000 VAC rms
Characteristic impedance	75 Ω
V.S.W.R.	40dB or more at 70 \pm 10MHz

Function

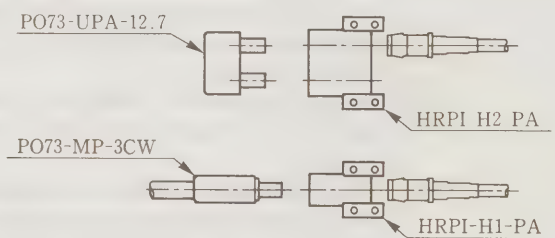
4 Way Housing



2 Way Housing (Include Electric Contact 64 Way)



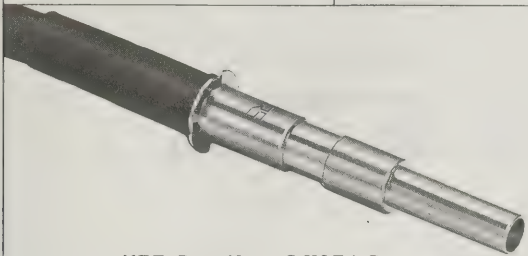
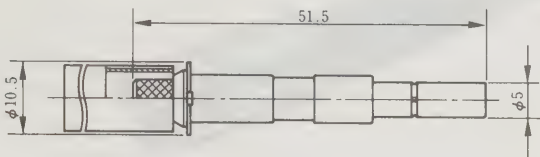
For Monitor



Adaptor

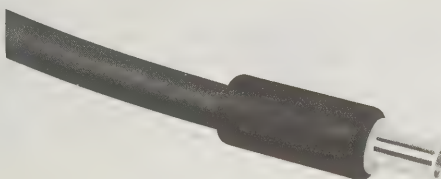


▲ Plug

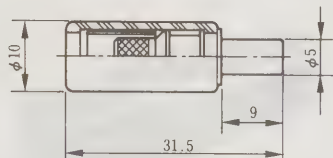
HRS No.	Part No.	Applicable Cable
	PO73-P-3CT	3C-2T
 <p>NTT Part No. : C-H3TA-P</p>		

▲ Monitor Plug

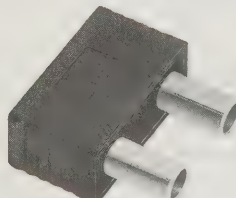
Part No.	Applicable Cable
PO73-MP-3CW	3C-2W

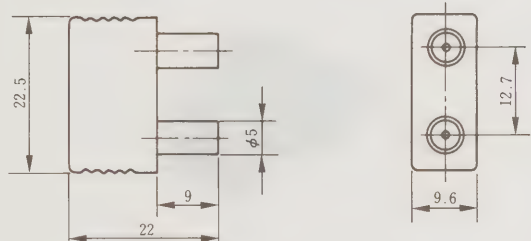


NTT Part No. : C-H3W-MP

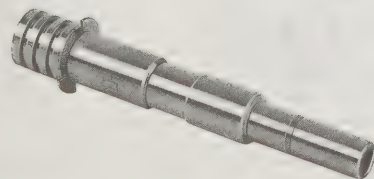


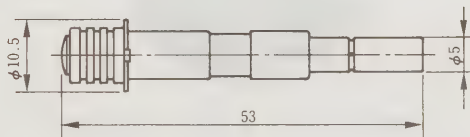
▲ U Link Plug

Part No.	—
PO73-UPA-12.7	—
	
NTT Part No. : C-H3C-UP	

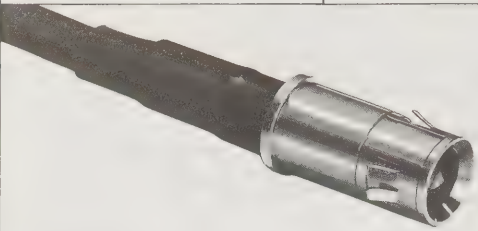
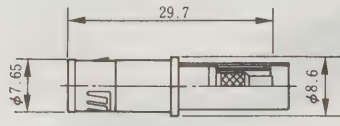

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▲ Termination

Part No.	—
PO73-TMP-75	—
	
NTT Part No. : C-H3C-TRM	


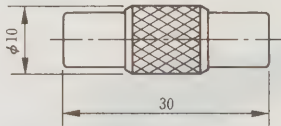
	
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▲ Jack

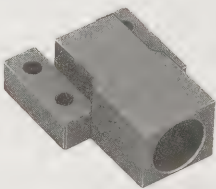
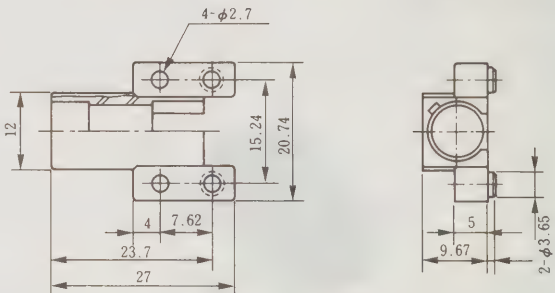
Part No.	Applicable Cable
PO73-J-2.5CV	2.5C-2V
	
	

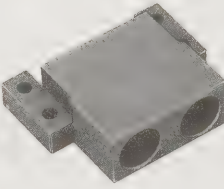
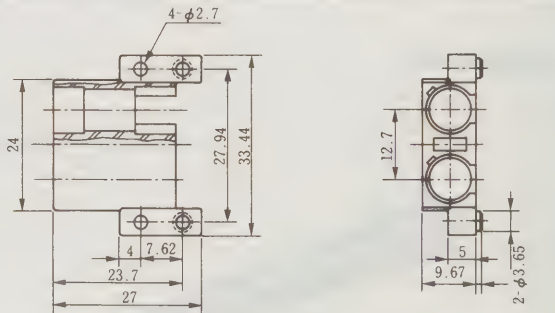
※ The housings for Jack that are slightly different in form from maker to maker are available. Please use HIROSE products to avoid the quality trouble.

▲ Adapter

Part No.	—
PO73-A-JJ	—
	
	
NTT Part No. : C-H3C-JA	

▲ Connector Housing for Monitor

Part No.	—
HRPI-H1 PA	—
	
	

Part No.	—
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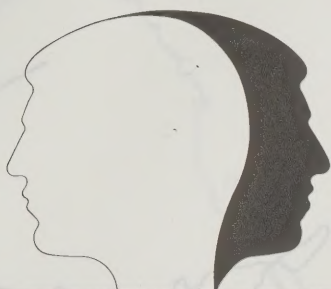
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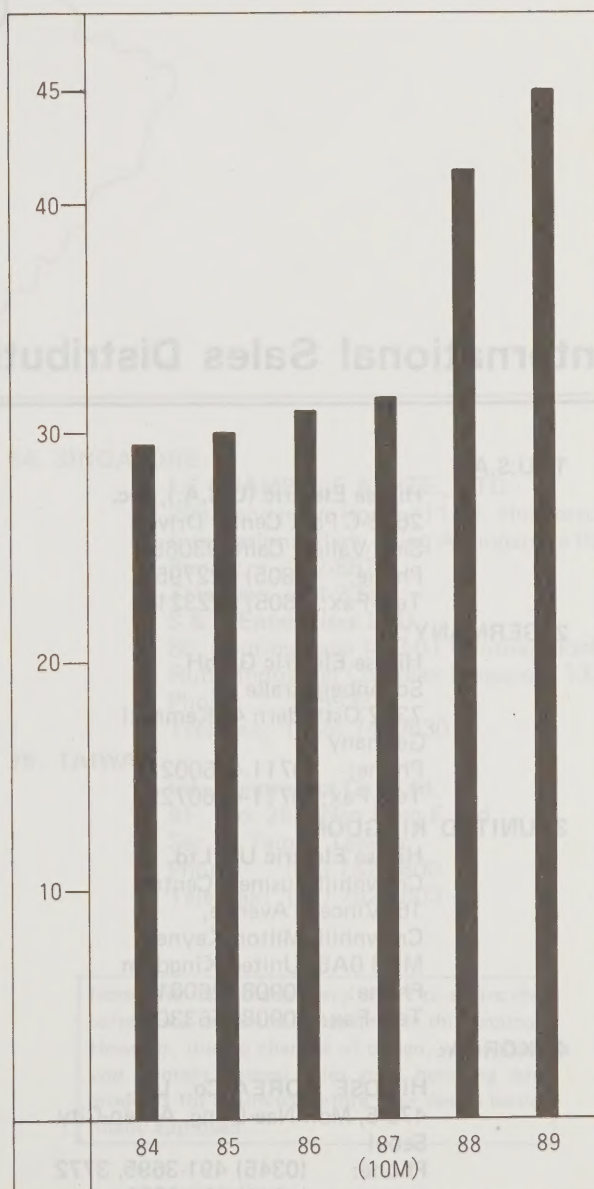


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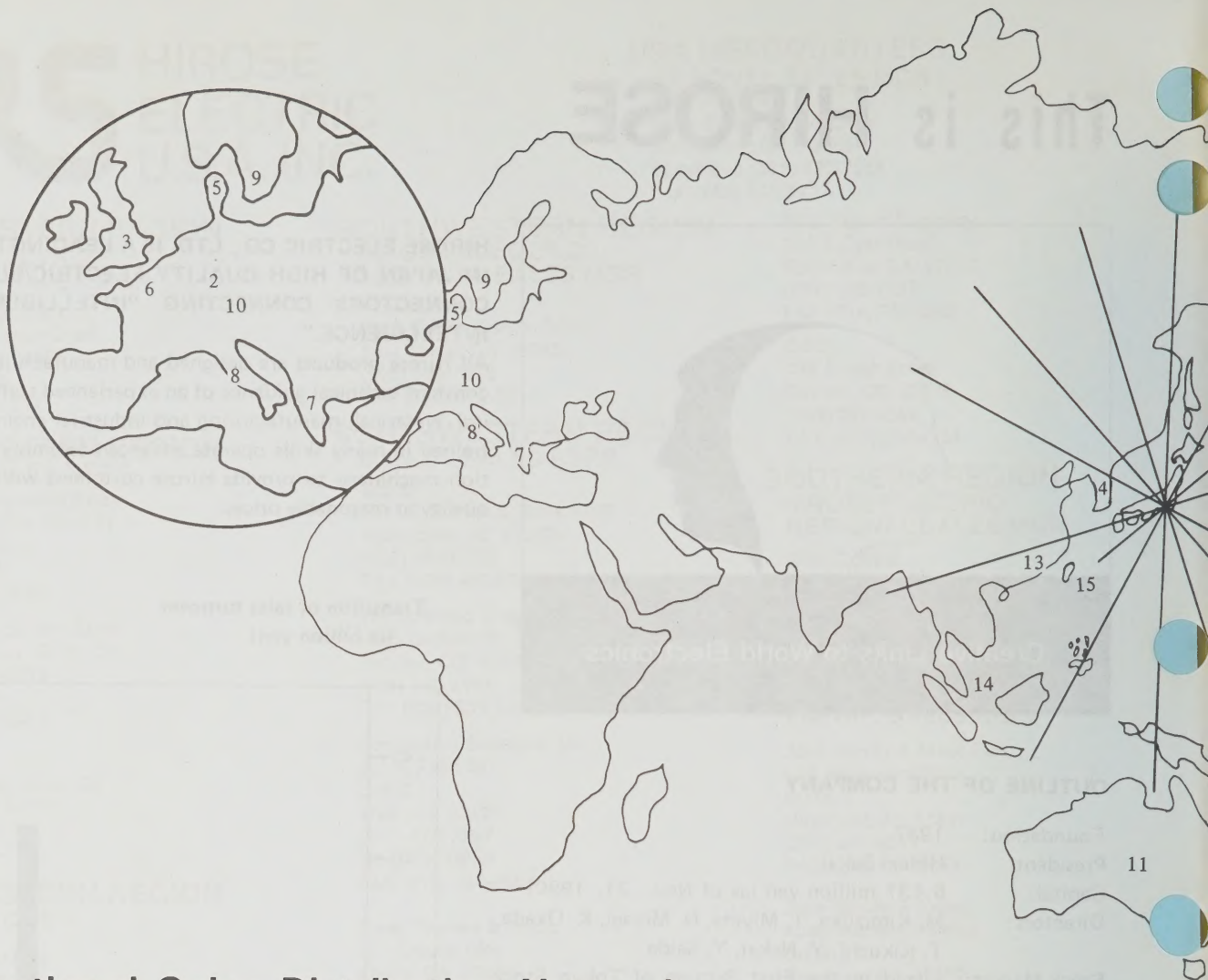
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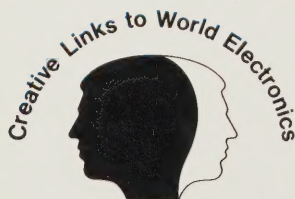
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